OfficeConnect®

Wireless 11a/b/g Access Point
User Guide

3CRWE454A72

The Standard for
Wireless Fidelity.

http://www.3com.com/

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CONTENTS

ABOUT THIS GUIDE

Naming Convention 7
Conventions 8
Feedback about this User Guide 8
Related Documentation 9
Product Registration 9

1 INTRODUCING THE ACCESS POINT

OfficeConnect Wireless 11g Access Point 12
Access Point Advantages 13
Package Contents 13
Minimum System and Component Requirements 14
Front Panel 14
Rear Panel 16

2 HARDWARE INSTALLATION

Introduction 17
Safety Information 17
Positioning the Access Point 17
Using the Rubber Feet 18
Wall Mounting 18
Powering Up the Access Point 19
Connecting the Access Point 19

3 RUNNING THE SETUP WIZARD

Accessing the Wizard 21
LAN Settings 27

4 ACCESS POINT CONFIGURATION

Navigating Through the Access Point Configuration Pages 29

Main Menu 29
Status Page 30
Wizard 31
LAN Settings 32
32
Wireless Settings 33
Wireless 33
Encryption 35
Configuring Encryption 36
Configuring WPA Encryption 37
Configuring WEP Encryption 38
Access Control 39
802.1X Authentication 41
WDS (Wireless Distributed System) 42
Password 43
System Tools 44
Reboot 44
Configuration Tools 45
Firmware Upgrade 46

5 TROUBLESHOOTING

Basic Connection Checks 49
Browsing to the Access Point Configuration Screens 49
Forgotten Password and Reset to Factory Defaults 50
Wireless Networking 50
Alert LED 52
Recovering from Corrupted Software 52
Frequently Asked Questions 53

A USING DISCOVERY

Running the Discovery Application 55
Windows Installation (95/98/2000/Me/ NT/XP) 55

B IP ADDRESSING

The Internet Protocol Suite 57
Managing the Access Point over the Network 57

IP Addresses and Subnet Masks 57
How does a Device Obtain an IP Address and Subnet Mask? 59
DHCP Addressing 59
Static Addressing 59
Auto-IP Addressing 59

C TECHNICAL SPECIFICATIONS
Standards 62

D SAFETY INFORMATION

E END USER SOFTWARE LICENSE AGREEMENT

GLOSSARY

INDEX

REGULATORY NOTICES FOR THE WIRELESS 11G ACCESS POINT

About This Guide

This guide describes how to install and configure the OfficeConnect Wireless 11a/b/g Access Point (3CRWE454A72).

This guide is intended for use by those responsible for installing and setting up network equipment; consequently, it assumes a basic working knowledge of LANs (Local Area Networks).

If a release note is shipped with the OfficeConnect Wireless 11a/b/g Access Point and contains information that differs from the information in this guide, follow the information in the release note.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) on the 3Com World Wide Web site:

http://www.3com.com

Naming Convention

Throughout this guide, the OfficeConnect Wireless 11a/b/g Access Point is referred to as the "Access Point".

Category 3 and Category 5 Twisted Pair Cables are referred to as Twisted Pair Cables throughout this guide.

The PC used to configure the Access Point is referred to as the "admin computer". 3Com recommends that during the initial configuration that this is connected to the same switch or hub as the Access Point.

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions.
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device.
	Warning	Information that alerts you to potential personal injury.

Table 2 Text Conventions

Convention	Description
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press Return or Enter. Do not press Return or Enter when an instruction simply says "type."
Keyboard key names	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del
Words in *italics*	Italics are used to: ■ Emphasize a point. ■ Denote a new term at the place where it is defined in the text. ■ Identify menu names, menu commands, and software button names. Examples: From the *Help* menu, select *Contents*. Click *OK*.

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Your suggestions are very important to us. They will help make our documentation more useful to you. Please e-mail comments about this document to 3Com at:

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- Document part number (on the title page)
- Page number (if appropriate)

Example:

- OfficeConnect Wireless 11a/b/g Access Point User Guide
- Part Number DUA0045-4AAA02
- Page 24

Do not use this e-mail address for technical support questions. For information about contacting Technical Support, please refer to the Support and Safety Information sheet.

Related Documentation

In addition to this guide, each Access Point document set includes one Installation Guide. This guide contains the instructions you need to install and configure your Access Point.

Product Registration

You can now register your Access Point on the 3Com web site and receive up-to-date information on your product:

`http://esupport.3com.com`

1 Introducing the Access Point

Welcome to the world of networking with 3Com®. In the modern business environment, communication and sharing information is crucial. Computer networks have proved to be one of the fastest modes of communication but, until recently, only large businesses could afford the networking advantage. The OfficeConnect® product range from 3Com has changed all this, bringing networks to the small office.

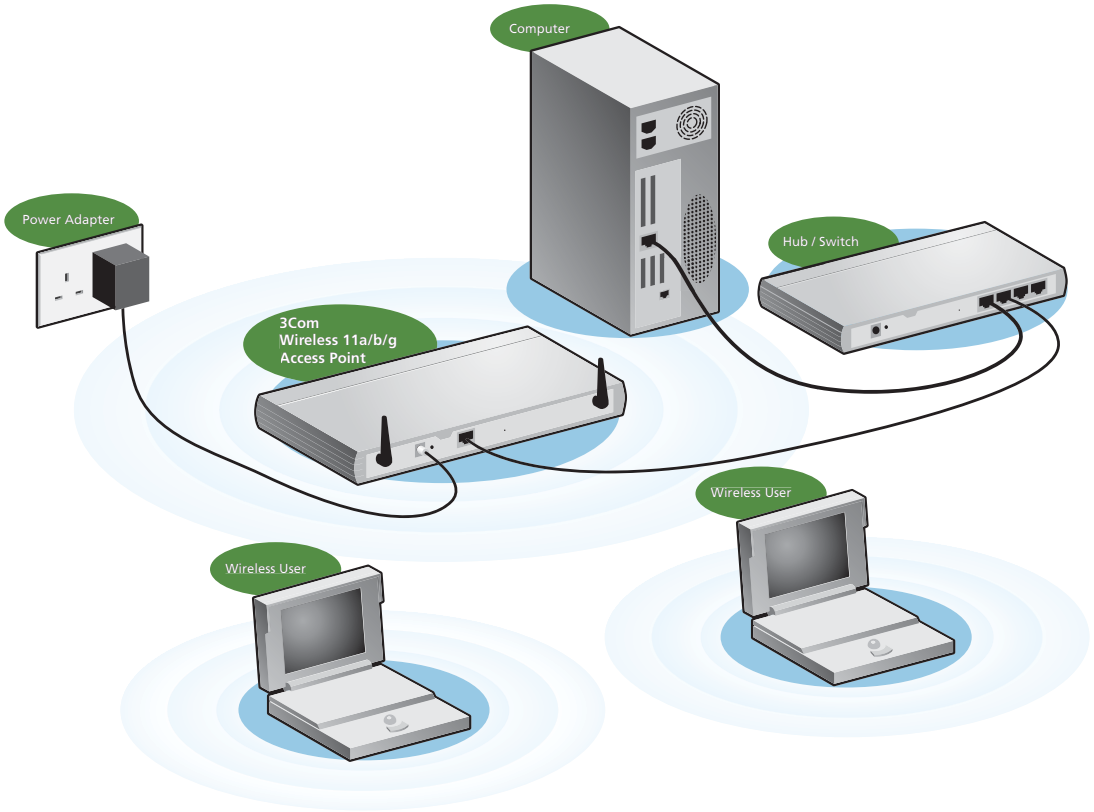
The products within the OfficeConnect range give you, the small office user, the same power, flexibility, and protection that has been available only to large corporations. Now, you can harness the benefits of wireless networking.

OfficeConnect Wireless 11g Access Point

The OfficeConnect Wireless 11a/b/g Access Point is designed to provide a cost-effective means of connecting wired and wireless networks.

A single Access Point makes the Internet, e-mail and network resources, such as printers, available to dozens of wireless clients. Because the Access Point is a WI-FI certified device, you can be sure it will work reliably with certified equipment from other manufacturers.

Figure 1 Example Network



Access Point Advantages

The advantages of the Access Point include:

- Cross-platform operation for compatibility with Windows, Unix and Macintosh computers
- Easy-to-use, Web-based setup and configuration
- Shared network resources between both wired and wireless computers
- Networking for 11a, 11b and 11g wireless clients
- Support for Wireless Equivalent Privacy (WEP) and Wi-Fi Protected Access® (WPA) encryption methods.

Package Contents

The Access Point kit includes the following items:

- One OfficeConnect Wireless 11a/b/g Access Point
- One power adapter for use with the Access Point
- Four rubber feet
- One Ethernet cable
- One CD-ROM containing the Access Point Discovery program and this User Guide
- Installation Guide
- One Support and Safety Information Sheet
- One Warranty Flyer

If any of these items are missing or damaged, please contact your retailer.

Minimum System and Component Requirements

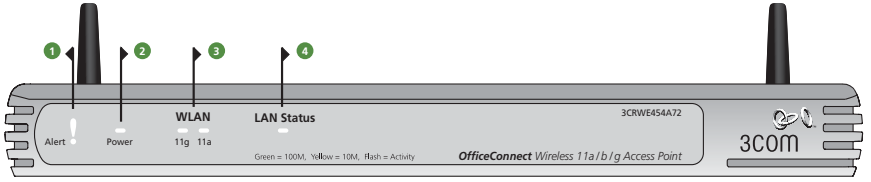
Your Access Point requires that the computer(s) and components in your network be configured with at least the following:

- A computer with an operating system that supports TCP/IP networking protocols (for example Windows 95/98/NT/Me/2000/XP, Unix, Mac OS 8.5 or higher).
- An Ethernet 10Mbps or 10/100 Mbps or 10/100/1000 Mbps NIC.
- An 802.11b, 802.11g or 802.11a wireless NIC.
- A Web browser program that supports JavaScript, such as Netscape 4.7 or higher, Internet Explorer 5.0 or higher, or Mozilla 1.2.1 or higher.

Front Panel

The front panel of the Access Point contains a series of indicator lights (LEDs) that help describe the state of various networking and connection operations.

Figure 2 Access Point - Front Panel



1 Alert LED

Orange

Indicates a number of different conditions, as described below.

Off - The Access Point is operating normally.

Flashing quickly - Indicates one of the following conditions:

- The Access Point has just been started up and is running a self-test routine, or
- The administrator has invoked the *Reset to Factory Defaults* command, or
- The system software is in the process of being upgraded

In each of these cases, wait until the Access Point has completed the current operation and the alert LED is Off.

Flashing slowly - The Access Point has completed the *Reset to Factory Defaults* process, and is waiting for you to release the reset button. The Access Point will then enter the start-up sequence and resume normal operation.

If you have used the reset button to reset the unit to Factory Defaults, follow steps 5 to 6 in "Forgotten Password and Reset to Factory Defaults" *on* page 50.

Continuously on - A fault has been detected with your Access Point during the start-up process. Refer to Chapter 5 "Troubleshooting".

2 Power LED

Green

Indicates that the Access Point is powered on.

3 Wireless LAN (WLAN) Status LEDs

Yellow

There are two LEDs, one for 11a and one for 11g. If an LED is flashing it indicates that wireless networking is enabled. The LED is flashing shows that data is being transmitted or received. If the LED is off, the Wireless LAN has been disabled in the Access Point, or there is a problem. Refer to Chapter 5 "Troubleshooting".

4 LAN Status LED

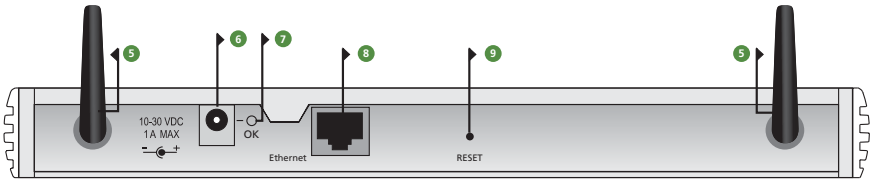
Green (100Mbps link) / yellow (10Mbps link)

If the LED is on, the link between the port and the next piece of network equipment is OK. If the LED is flashing, the link is OK and data is being transmitted or received. If the LED is off, nothing is connected, the connected device is switched off, or there is a problem with the connection (refer to Chapter 5 "Troubleshooting"). The port will automatically adjust to the correct speed and duplex.

Rear Panel

The rear panel (Figure 3) of the Access Point contains one LAN port, a reset button, a power adapter OK LED and a power adapter socket.

Figure 3 Access Point - Rear Panel



5 Wireless Antennae

The antennae on the product should be placed in a 'V' position when initially installed.

CAUTION: *Do not force the antennae round further than 90 degrees in either direction.*

6 Power Adapter Socket

Only use the power adapter supplied with this Access Point. Do not use any other adapter.

7 Power Adapter OK LED

Green

Indicates that the power adapter is supplying Power to the Access Point. If the LED is off, there may be a problem with the power adapter or adapter cable.

8 Ethernet Port

Use the supplied patch cable to connect the Access Point to the LAN. The port will automatically adjust to the correct speed and duplex.

9 Reset Button

This button allows you to reset the unit to factory defaults.

2 HARDWARE INSTALLATION

Introduction

This chapter will guide you through a basic installation of the Access Point, including:

- Connecting the Access Point to your network.
- Setting up your computers for networking with the Access Point.

Safety Information

WARNING: *Please read the "Safety Information" section in Appendix D before you start.*

VORSICHT: *Bitte lesen Sie den Abschnitt "Wichtige Sicherheitshinweise" sorgfältig durch, bevor Sie das Gerät einschalten.*

AVERTISSEMENT: *Veuillez lire attentivement la section "Consignes importantes de sécurité" avant de mettre en route.*

Positioning the Access Point

You should place the Access Point in a location that:

- allows convenient connection to the computer or other ethernet device that will be connected to the LAN port on the rear panel.
- allows easy viewing of the front panel LED indicator lights, and access to the rear panel connectors, if necessary.
- is centrally located to the wireless computers that will connect to the Access Point. A suitable location might be on top of a high shelf or similar furniture to optimize wireless connections to computers in both horizontal and vertical directions, allowing wider coverage.

When positioning your Access Point, ensure:

- It is out of direct sunlight and away from sources of heat.
- Cabling is away from power lines, fluorescent lighting fixtures, and sources of electrical noise such as radios, transmitters and broadband amplifiers.
- Water or moisture cannot enter the case of the unit.
- Air flow around the unit and through the vents in the side of the case is not restricted. 3Com recommends you provide a minimum of 25 mm (1 in.) clearance.

Using the Rubber Feet

Use the four self-adhesive rubber feet to prevent your Access Point from moving around on your desk or when stacking with other flat top OfficeConnect units. Only stick the feet to the marked areas at each corner of the underside of your Access Point.

Wall Mounting

There are two slots on the underside of the Access Point that can be used for wall mounting.

When wall mounting the unit, ensure that it is within reach of the power outlet.

You will need two suitable screws to wall mount the unit. To do this:

1. Ensure that the wall you use is smooth, flat, dry and sturdy and make two screw holes which are 150 mm (5.9 in.) apart.
2. Fix the screws into the wall, leaving their heads 3 mm (0.12 in.) clear of the wall surface.
3. Remove any connections to the unit and locate it over the screw heads. When in line, gently push the unit on to the wall and move it downwards to secure.

CAUTION: *Only wall mount single units, do not wall mount stacked units.*

Powering Up the Access Point

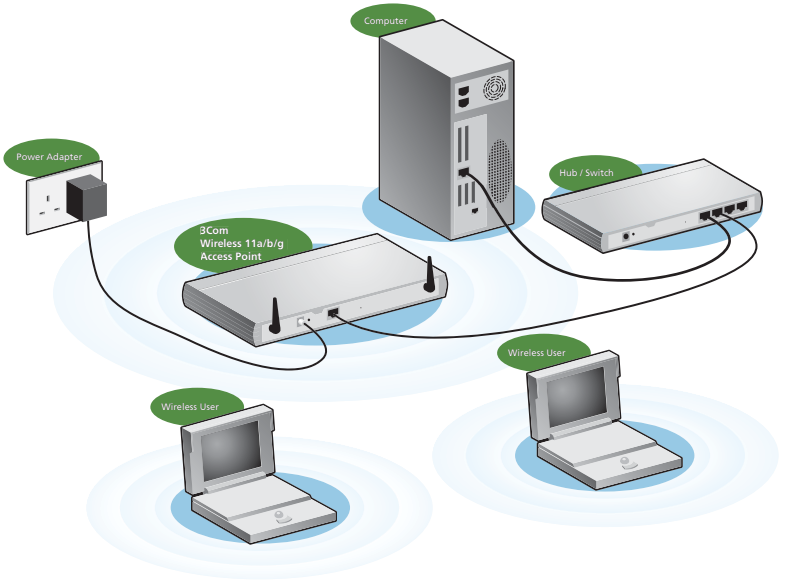
To power up the Access Point:

1. Plug the power adapter into the power adapter socket located on the back panel of the Access Point.
2. Plug the power adapter into a standard electrical wall socket.

Connecting the Access Point

The first step for installing your Access Point is to physically connect it to a switch or hub. See Figure 4.

Figure 4 Connecting the Access Point



To use your Access Point to connect to the wireless LAN to the wired LAN:

1. Insert one end of the supplied Ethernet (RJ-45 Category 5) cable into the LAN port on the rear panel of the Access Point.
2. Insert the other end of the cable into the RJ-45 port on switch or hub. Check that the LAN status LED lights on the Access Point.

You have now completed the hardware installation of your Access Point. Next you need to set up your computers so that they connect to the Access Point.

3 RUNNING THE SETUP WIZARD

Accessing the Wizard

3Com recommends that you perform the initial Access Point configuration from a computer that is directly connected to the LAN port and not from a wireless connection.

If, however, you do configure the Access Point from a wireless admin computer DO NOT change the wireless configuration, or you risk losing contact with the Access Point. Yout wireless NIC should be set as follows:

- Encryption — none
- Service Area Name/SSID — 3Com

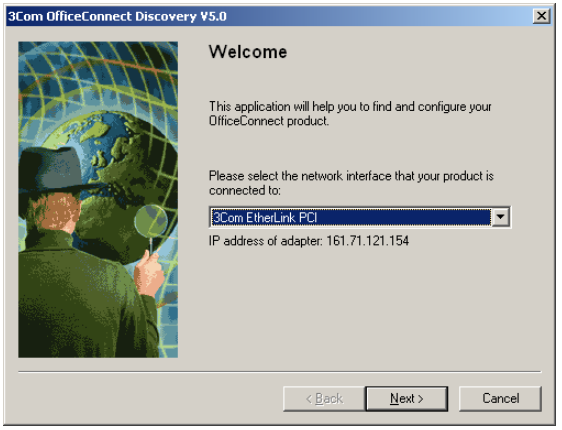
The Access Point setup program is Web-based, which means that it is accessed through your Web browser (Netscape Navigator, Internet Explorer or Mozilla).

To use the Setup Wizard:

1. Ensure that you have at least one computer connected to the Access Point. Refer to Chapter 2 for details on how to do this.
2. Insert the Access Point CD-ROM in the CD-ROM drive on your computer. A menu will appear; select *Discovery*.

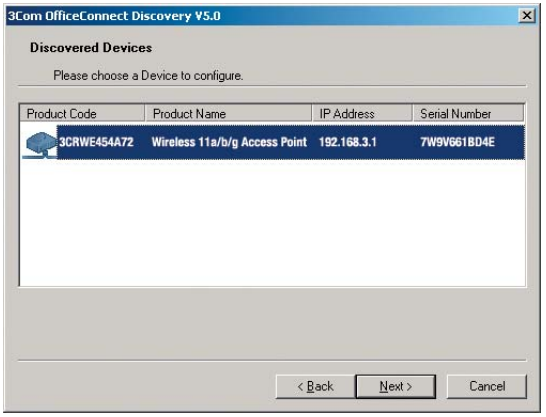
Discovery will find the Access Point even if it is unconfigured or misconfigured.

Figure 5 Discovery Welcome Screen


3Com OfficeConnect Discovery V5.0
Welcome
This application will help you to find and configure your OfficeConnect product.
Please select the network interface that your product is connected to:
3Com EtherLink PCI
IP address of adapter: 161.71.121.154
< Back
Next >
Cancel

3 When the *Welcome* screen is displayed, select the NIC from which the Access Point will be discovered. Then click on *Next* and wait until the application discovers the Access Points connected to your LAN.

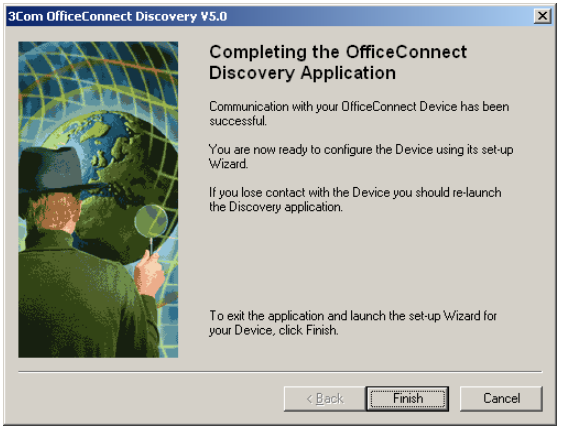
Figure 6 Discovered Access Point Screen



4 Figure 6 shows an example Discovered Devices screen. Highlight the *Wireless 11a/b/g Access Point* by clicking on it, and press *Next*.

If the discovery application finds multiple Access Points compare the serial number on the Discovered Devices Screen with the serial number on the base of your Access Point.

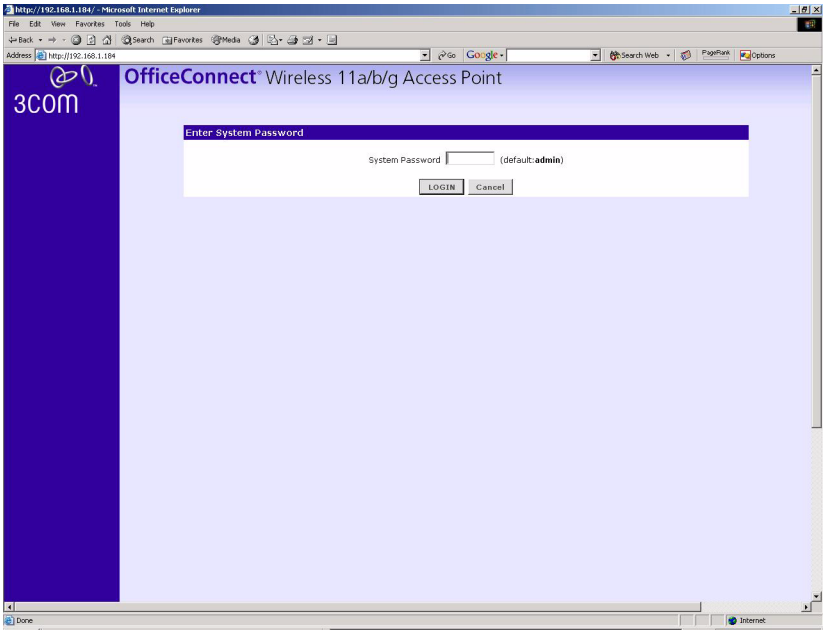
Figure 7 Discovery Finish Screen


3Com OfficeConnect Discovery V5.0
Completing the OfficeConnect Discovery Application
Communication with your OfficeConnect Device has been successful.
You are now ready to configure the Device using its set-up Wizard.
If you lose contact with the Device you should re-launch the Discovery application.
To exit the application and launch the set-up Wizard for your Device, click Finish.
< Back
Finish
Cancel

5 Click on *Finish* to launch a web browser and display the login page for the Access Point as shown in Figure 8.

6 To log in, enter the password (the default setting is **admin**) in the *System Password* field and click *Log in* (Figure 8).

Figure 8 Access Point Login Screen

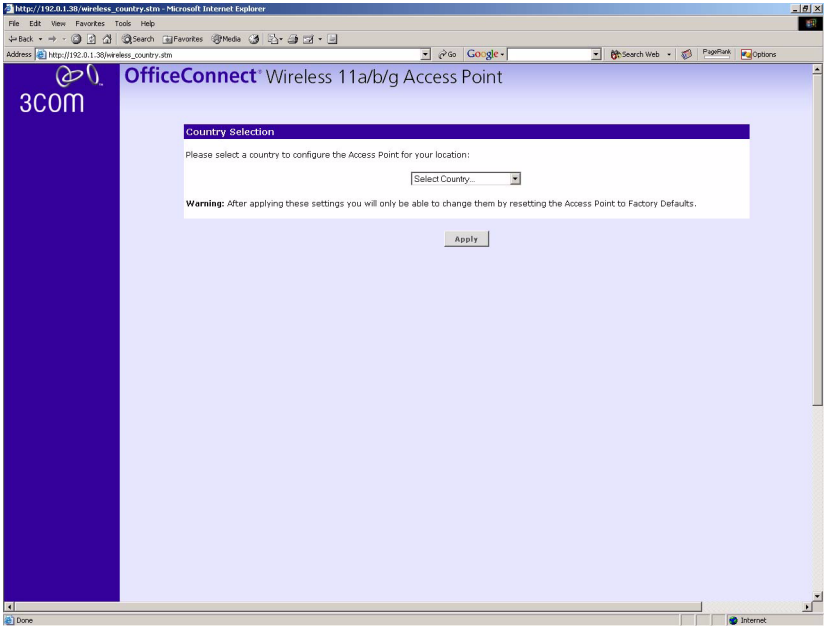


7 If the password is correct, the *Country & Mode Selection* screen appears. (Figure 9)

8 Select the country in which the Access Point is to operate.

The Country Selection *screen is only displayed on initial configuration of the Access Point.*

Figure 9 Country Selection Screen


http://192.0.1.38/wireless_country.stm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.0.1.38/wireless_country.stm
3com
OfficeConnect® Wireless 11a/b/g Access Point
Country Selection
Please select a country to configure the Access Point for your location:
Select Country...
Warning: After applying these settings you will only be able to change them by resetting the Access Point to Factory Defaults.
Apply
Done
Internet

9 When you have logged in and selected a country either:

- The *Status* screen will appear (Figure 10). Select the *Wizard* option from the menu on the left hand side.

  or

- If your Access Point has not been configured before, the Wizard page will be shown (refer to Figure 10).

10 Click *Next*.

11 You will be guided step by step through a basic setup procedure.

Figure 10 Welcome Screen

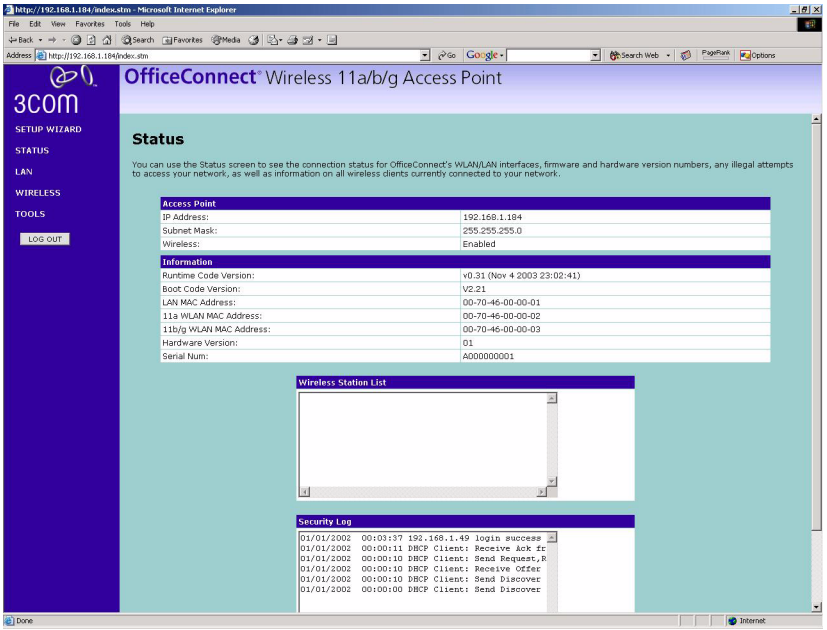
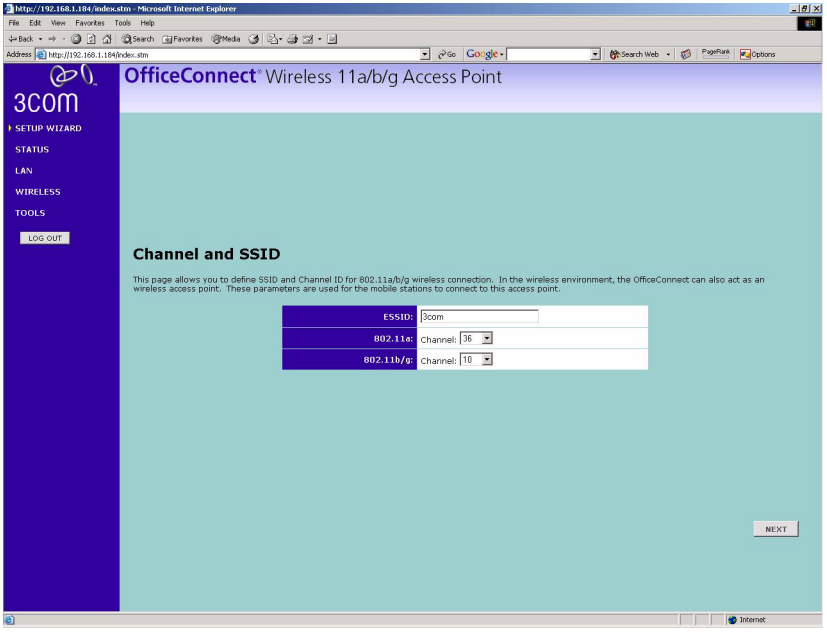

http://192.168.1.184/index.stm - Microsoft Internet Explorer
3com
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
LOG OUT
OfficeConnect® Wireless 11a/b/g Access Point
Status
You can use the Status screen to see the connection status for OfficeConnect's WLAN/LAN interfaces, firmware and hardware version numbers, any illegal attempts to access your network, as well as information on all wireless clients currently connected to your network.
Access Point
IP Address: 192.168.1.184
Subnet Mask: 255.255.255.0
Wireless: Enabled
Information
Runtime Code Version: v0.31 (Nov 4 2003 23:02:41)
Boot Code Version: V2.21
LAN MAC Address: 00-70-46-00-00-01
11a WLAN MAC Address: 00-70-46-00-00-02
11b/g WLAN MAC Address: 00-70-46-00-00-03
Hardware Version: 01
Serial Num: A000000001
Wireless Station List
Security Log
01/01/2002 00:03:37 192.168.1.49 login success
01/01/2002 00:00:11 DHCP Client: Receive Ack fr
01/01/2002 00:00:10 DHCP Client: Send Request,R
01/01/2002 00:00:10 DHCP Client: Receive Offer
01/01/2002 00:00:10 DHCP Client: Send Discover
01/01/2002 00:00:00 DHCP Client: Send Discover
Done
Internet

Figure 11 Setup Wizard


http://192.168.1.184/index.stm - Microsoft Internet Explorer
3com
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
LOG OUT
OfficeConnect® Wireless 11a/b/g Access Point
Channel and SSID
This page allows you to define SSID and Channel ID for 802.11a/b/g wireless connection. In the wireless environment, the OfficeConnect can also act as an wireless access point. These parameters are used for the mobile stations to connect to this access point.
ESSID: 3com
802.11a: Channel: 36
802.11b/g: Channel: 10
NEXT
Internet

1 Select channels for the Access Point to use or Auto if you want the Access Point to choose an unused channel on start-up.

2 Enter a Service Area Name/SSID.

The *Service Area Name* default for 3Com products is "3Com". Up to 32 (case sensitive) characters can be entered for the *Service Area Name*.

3Com strongly recommends that you change the *SSID* to something other than the default.

For information on improving your Wireless network security see "Wireless Settings" *on* page 33.

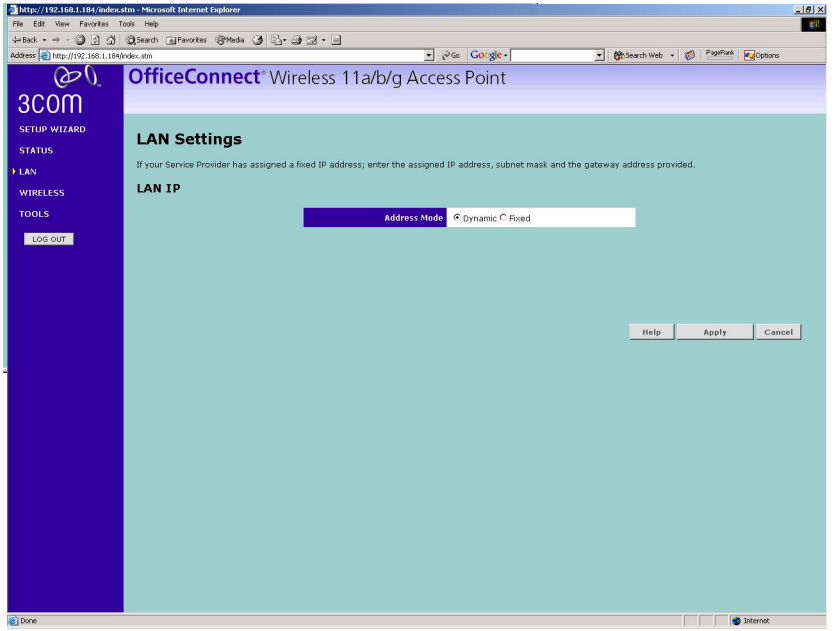
If you are configuring the Access Point from a wireless computer any changes you make to the wireless configuration will result in communication between the Access Point and your computer being lost. This is why 3Com strongly recommends that you configure the Access Point from a wired computer.

It is very important that you set up your wireless clients to use the same Service Area Name or SSID as the one you use on this screen. If your clients use a different Service Area Name then they will not be able to communicate with the Access Point.

The choice of channel is less important as Clients will generally search all of the available channels. You should however make a note of the channel you select as this may be useful if you experience problems with your clients.

LAN Settings

Figure 12 LAN Settings Screen



This screen determines how the Access Point obtains its IP address. There are three options.

Obtain IP Address automatically - The Access Point will obtain an IP address from a DHCP server already operating on your network.

Specify an IP address manually - Select this option to manually configure the IP address of the Access Point. This screen displays a suggested LAN IP address, subnet mask and default gateway of the Access Point. It also allows you to change the IP address, subnet mask and default gateway.

3Com recommends that you manually assign your Access Point a static IP address.

4 Access Point Configuration

Navigating Through the Access Point Configuration Pages

This chapter describes all the screens available through the Access Point configuration pages, and is provided as a reference. To get to the configuration pages, browse to the Access Point by entering the URL in the location bar of your browser. The URL is **`http://<IP Address of the Access Point>`**, for example **`http://192.168.1.1`**. When you have browsed to the Access Point, log in using your system password (default **`admin`**).

Main Menu

At the left side of all screens is a main menu, as shown in Figure 13 on page 30. When you click on a topic from the main menu, that page will appear in the main part of the screen. If there are more option for the menu selection then these will appear under the original menu option.

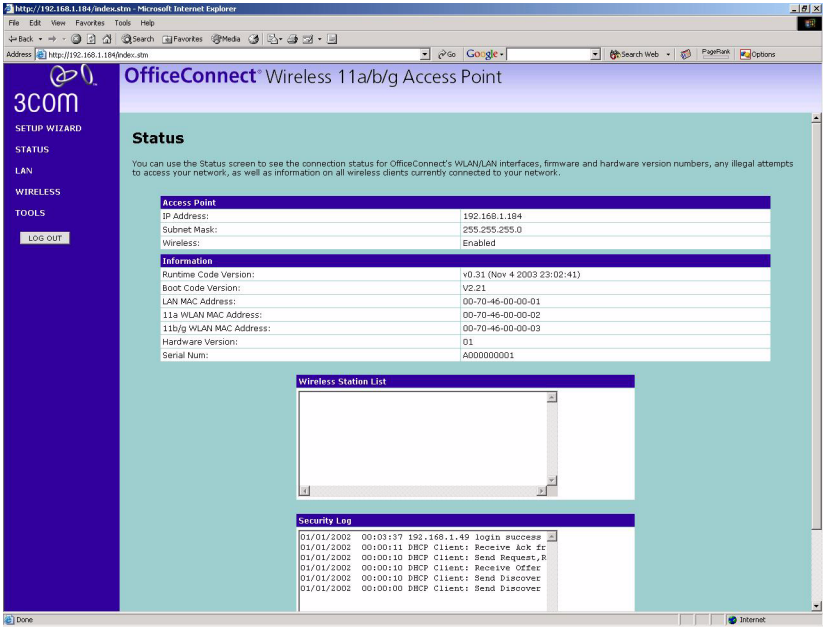
- Wizard - Allows a quick configuration of the basic functions of the Access Point
- Status - displays the firmware version of the Access Point, current IP address, lists showing connected wireless clients and log file entries.
- LAN - allows you to configure IP address, subnet mask, and default gateway information.
- Wireless - enables /disables access from wireless computers, and provides facilities for improving the security of the wireless network.
- Tools - allows the administrator to perform maintenance activities on the Access Point.

Getting Help

On every screen, a Help button is available which provides access to the context-sensitive online help system. Click *Help* for further assistance and guidance relating to the current screen.

Status Page

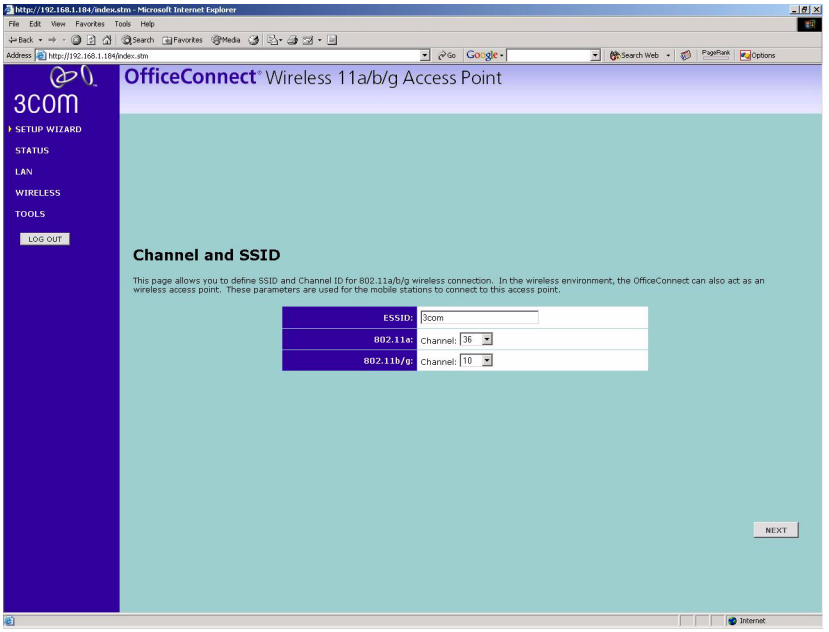
Figure 13 Access Point Status Screen


http://192.168.1.184/index.stm - Microsoft Internet Explorer
3com
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
LOG OUT
OfficeConnect® Wireless 11a/b/g Access Point
Status
You can use the Status screen to see the connection status for OfficeConnect's WLAN/LAN interfaces, firmware and hardware version numbers, any illegal attempts to access your network, as well as information on all wireless clients currently connected to your network.
Access Point
IP Address: 192.168.1.184
Subnet Mask: 255.255.255.0
Wireless: Enabled
Information
Runtime Code Version: v0.31 (Nov 4 2003 23:02:41)
Boot Code Version: V2.21
LAN MAC Address: 00-70-46-00-00-01
11a WLAN MAC Address: 00-70-46-00-00-02
11b/g WLAN MAC Address: 00-70-46-00-00-03
Hardware Version: 01
Serial Num: A000000001
Wireless Station List
Security Log
01/01/2002 00:03:37 192.168.1.49 login success
01/01/2002 00:00:11 DHCP Client: Receive Ack fr
01/01/2002 00:00:10 DHCP Client: Send Request,R
01/01/2002 00:00:10 DHCP Client: Receive Offer
01/01/2002 00:00:10 DHCP Client: Send Discover
01/01/2002 00:00:00 DHCP Client: Send Discover

The *Status* section allows you to view the IP address of the unit, firmware version, wireless clients and security log.

Wizard

Figure 14 Wizard Screen


http://192.168.1.184/index.stm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.1.184/index.stm
3com
OfficeConnect® Wireless 11a/b/g Access Point
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
LOG OUT
Channel and SSID
This page allows you to define SSID and Channel ID for 802.11a/b/g wireless connection. In the wireless environment, this OfficeConnect can also act as an wireless access point. These parameters are used for the mobile stations to connect to this access point.
ESSID: 3com
802.11a: Channel: 36
802.11b/g: Channel: 10
NEXT
Internet

Click *WIZARD...* to launch the configuration wizard. Refer to Chapter 3 for information on how to run the wizard.

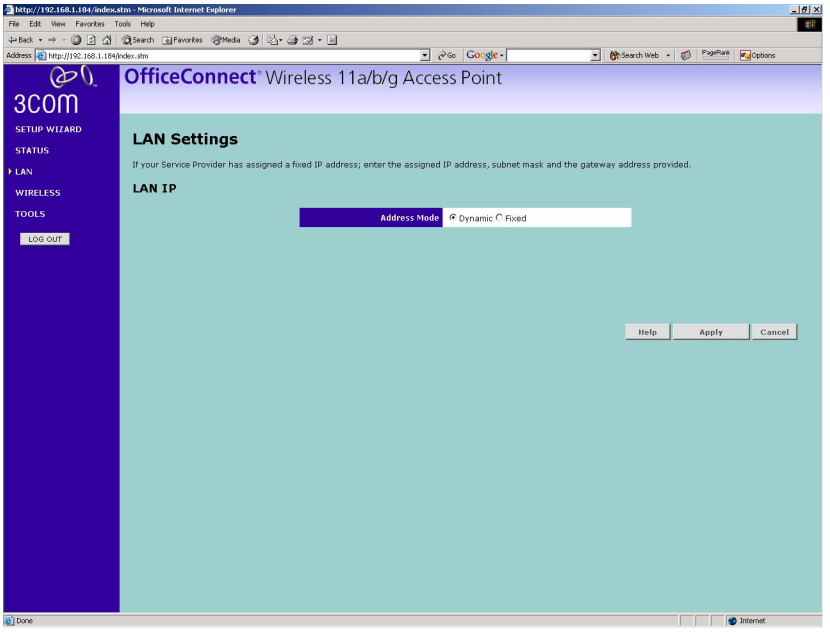
LAN Settings

The LAN Settings menu provides the following options:

The LAN Settings screen is used to determine how the LAN IP address of your Access Point is obtained. It can be obtained automatically (dynamic IP) or you can manually configure the IP address (static IP).

3Com recommends that you manually assign your Access Point a static IP address.

Figure 15 Unit Configuration Screen



Dynamic IP Address

Select *Dynamic IP Address (automatically allocated)* and the screen shown in Figure 15 is displayed. Check all your settings and click *Apply*.

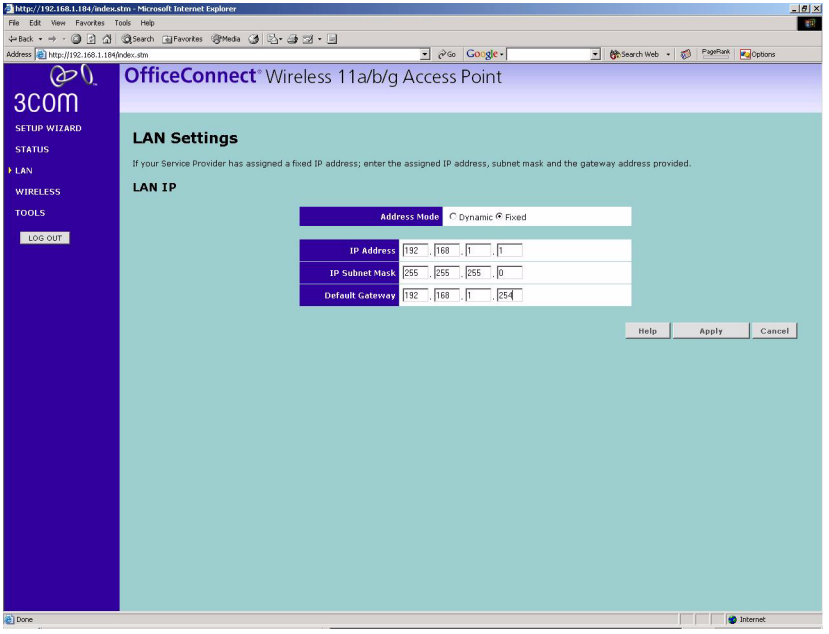
If the Access Point is set to obtain an IP address automatically and is unable to contact a DHCP server then it will allocate itself an address in the 169.254.xxx.xxx range.

Manually setting the IP address

3Com recommends that you assign your Access Point a static IP address.

1 Select *LAN* and then select *Static IP Address (to be specified manually)*. The screen shown in Figure 16 is displayed.

Figure 16 Unit Configuration Screen For Static IP Address



Wireless Settings

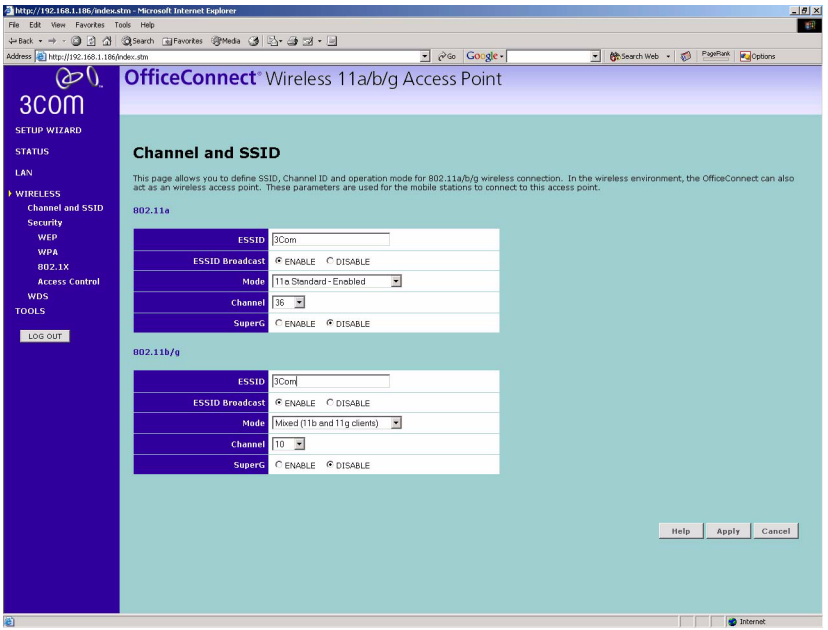
To improve the security of your wireless network, 3Com recommends that you:

1. Change the SSID from its default value - see page 34

2. Enable Encryption - see page 35

3. Enable Access Control - see page 39

Wireless **Figure 17** Wireless Settings



Channel Selection

The Channel Selectors allow you to specify which channels the Access Point will transmit and receive on. If another Access Point nearby is using the same channels as you, there will be a reduction in the performance of your network. If this seems to be the case, you should select a different channel number. Usually the Wireless computers will scan to find the correct channel, but if they don't you must configure them to use the same channel number as the Access Point.

Valid channels are country dependent. See "Channels" *on* page 81 *for a list of channels approved by each country.*

Auto allows the Access Point to automatically select an available channel when first powered on.

Service Area Name/SSID

This allows you to name your Wireless networks. The fields will accept any alphanumeric string and has a maximum length of 32 characters. Your Wireless computers must be configured with exactly the same name or you will not be able to establish a connection. The Service Area Name

may also be referred to as "ESSID" depending on your networking vendor. By default the Access Point uses the name "3Com". 3Com recommends that you change the default name.

In order that your wireless computers can connect to the Access Point, you must:

- *Use Infrastructure Mode not Adhoc Mode.*
- *Have the same Service Area Name as the Access Point.*
- *Use the same encryption type and keys as the Access Point.*
- *Ensure that the PC is included in the authorized Wireless PCs list if Connection Control is enabled. See* page 39*.*

Disable Broadcast SSID

This feature can be used to improve the security of your wireless network. When the tickbox is checked, the Access Point will not broadcast the Service Area Name/SSID of your wireless network. This will prevent unauthorized clients from detecting your SSID and attempting to connect to your network.

If you have a wireless client that can detect all the available SSIDs in your area, your client will not list the Access Point SSID when this feature is enabled.

3Com recommends that you install your wireless network with this feature disabled and then enable it once you have set up the Access Point and wireless clients.

If you set the Access Point to Disable Broadcast SSID*, the Access Point will not allow access to clients with the SSID field set to "*any*".*

Encryption

When setting up wireless networks, it is important to remember that with encryption disabled, anyone with a Wireless PC can eavesdrop on your network. 3Com recommends that you get the network working with encryption disabled first and then enable it as the last step. This will simplify setting up your network.

The Access Point supports two types of encryption:

- WPA — Wi-FI Protected Access (WPA) is a 256 bit encryption method with keys that change over time.

- WEP — Wireless Equivalent Privacy (WEP) is a 64 bit or 128 bit encryption method with user configurable fixed keys.

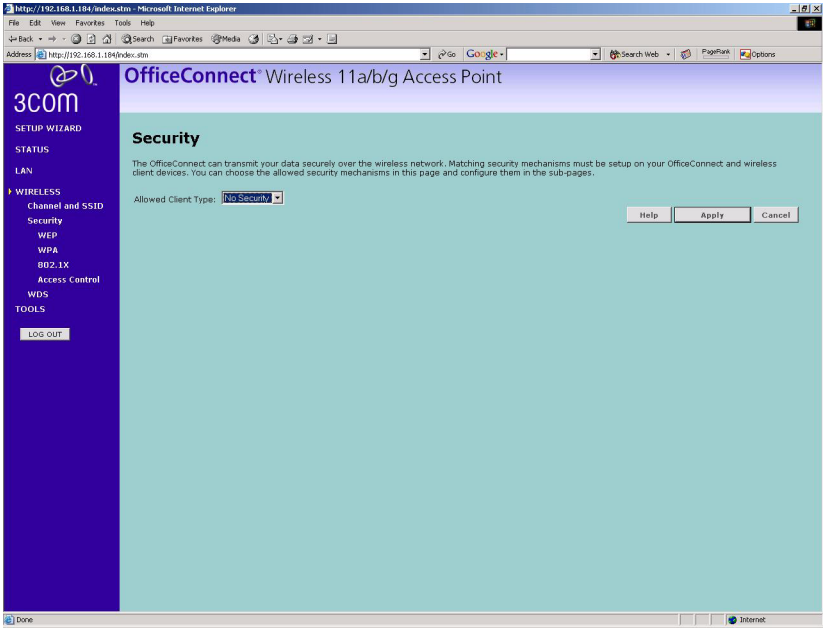
WPA provides a higher level of security, provided by its longer key and dynamic changes made to the key over time. 3Com recommends that you use WPA with any clients which support it.

If you enable encryption on the Access Point, you must reconfigure your wireless PCs to use exactly the same Encryption Type and Keys otherwise the devices will not understand each other.

The encryption methods used by the Access Point secure data transmitted through wireless communications between the Access Point and its wireless clients. Enabling encryption has no security effect on data transmitted through wired (Ethernet) connections or through your connections to the Internet.

Configuring Encryption

Figure 18 Security

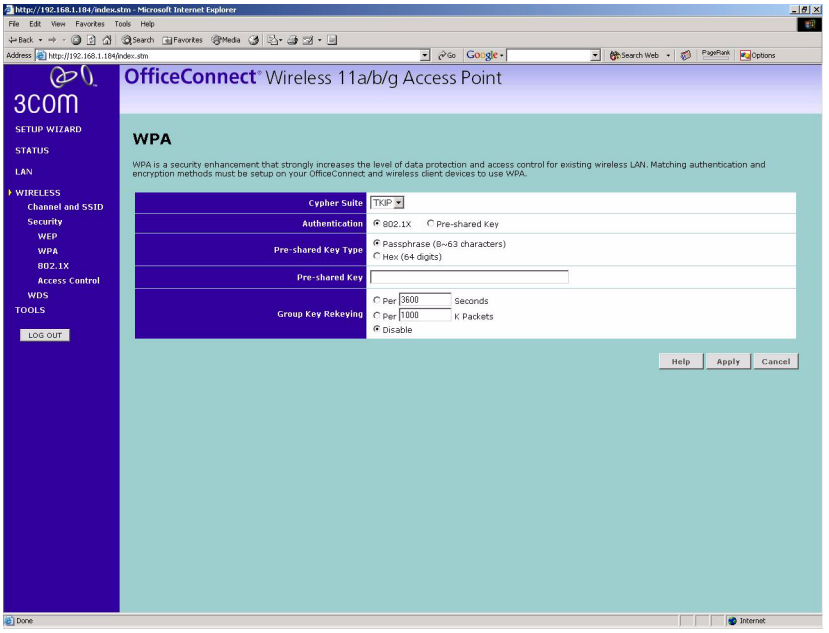


Select from the drop down list WEP only, WPA only, WEP/WPA, or No security.

Configuring WPA Encryption

The only configuration that is needed for WPA is to enter the pre-shared key. This key is used to start the dialog between the Access Point and the client. During this dialog, a new key is agreed, making it more difficult to eavesdrop on wireless networks encrypted using WPA, than those encrypted using WEP. The pre-shared key can be entered as a 256 bit series of hexadecimal digits or as a pass-phrase.

Figure 19 Encryption Keys Screen showing WPA configuration



To enter the pre-shared key as passphrase:

1. Select *Pre-shared Key* from the *Authentication* options.
2. Select *Preshared key type* passphrase.
3. Enter a phrase of between 8 and 63 characters in length in the *Pre-shared key* field. This passphrase will be used to generate a 256 bit key.
4. Click *Apply* to generate the key.

To enter the pre-shared key as hexadecimal digits

1. Select *Pre-shared Key* from the *Authentication* options.
2. Select *Preshared key type* HEX.
3. Enter 64 HEX digits in the *pre-shaed key* field

4 Click *Apply* to generate the key.

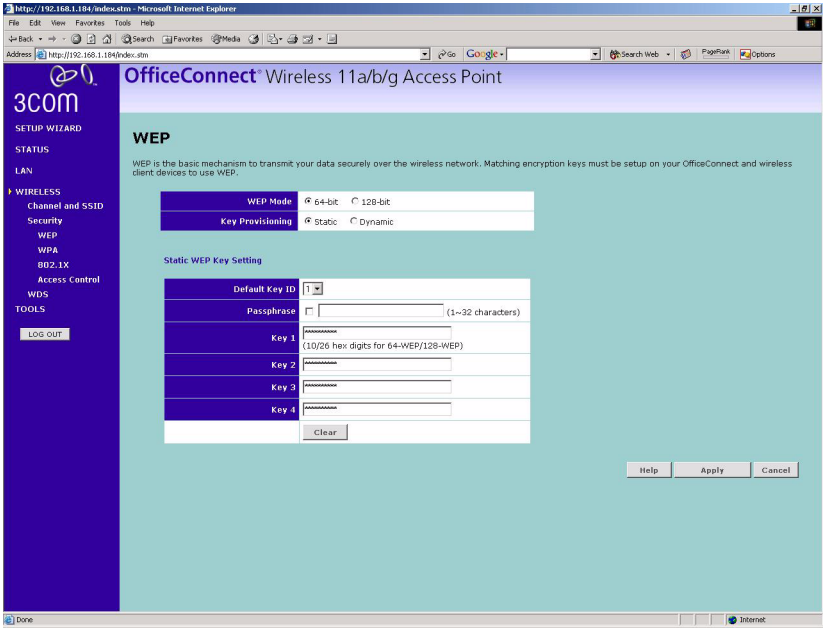
If 802.1X authentication is to be used please see 802.1X Authentication section.

Configuring WEP Encryption

There are two levels of WEP encryption available, 64 bit (sometimes referred to as 40 bit) and 128 bit. 128 bit will result in a higher level of security, but may cause a slight decrease in performance.

Encryption Keys

Figure 20 Encryption Keys Screen showing WEP configuration



A Key is a hexadecimal (0-9, A-F) number used to encrypt and decrypt the data. There can be up to 4 keys and each key can be as long as 26 digits. The Access Point also offers a method for converting plain text into hex keys. The text is much easier to remember than hex keys but it relies on your wireless adapters also supporting this feature. Different manufacturers have developed different ways of converting plain text and so interoperability is not guaranteed. If you are experiencing difficulty, the Manual Hex Key method is supported by most vendors.

There are two methods available to generate the encryption keys:

- Manual Key Entry - This method allows you to manually enter hex keys. Virtually all manufacturers support this scheme. Hexadecimal numbers are formed from 0-9 and A-F. Enter 10 or 26 digits depending on whether you are using 64 0r 128 bit WEP respectively.
- Passphrase - This is another common method. In 64 bit WEP, the passphrase will generate 4 different keys. However, in 128 bit WEP, this method only generates 1 key which is replicated for all 4 keys. The passphrase can be up to 31 characters long and may contain any alphanumeric characters.

If passphrase encryption is to used then tick the passphrase box. If Manual HEX is to be used leave this box unticked.

If you encounter any difficulty when you enable WEP ensure that you check that each key on your wireless computer is exactly the same as each key on your Access Point. In other words, Key number 1 on the Wireless computer must have the same Hex number as Key number 1 on the Access Point, Key 2 on the Wireless computer must match Key 2 on the Access Point and so on.

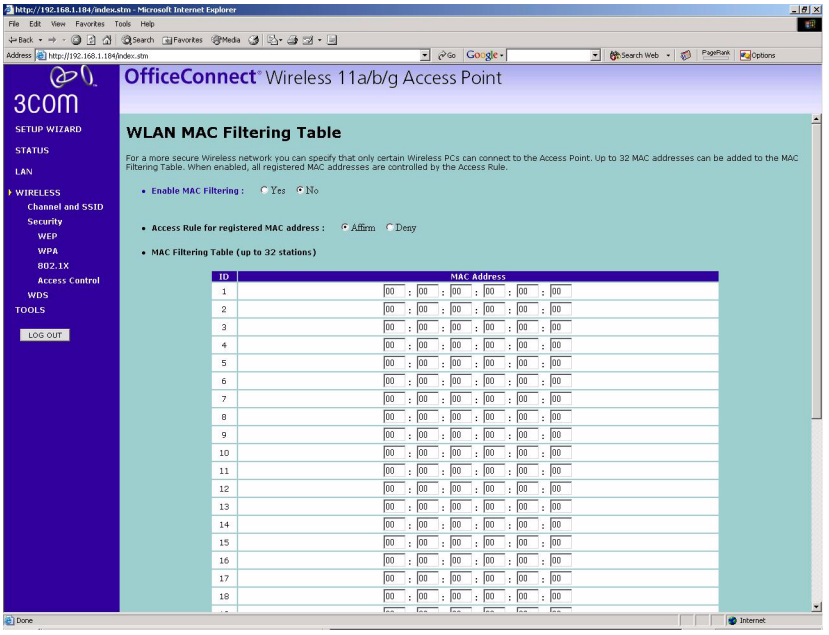
The *Active Transmit Key* selects which of the 4 Keys the Access Point uses when it transmits. You can change the selected key periodically to increase the security of your network.

Some wireless adapters have only one key available on their WEP configuration page. If this is the case ensure it is the same as Key 1 on the Access Point and that it is selected as the active transmit key.

Access Control

This screen allows you to determine if all Wireless PCs or just authorised Wireless PCs can use the Access Point. Select Access Control to display the screen shown in Figure 21.

Figure 21 Connection Control Screen


http://192.168.1.184/index.stm - Microsoft Internet Explorer
OfficeConnect Wireless 11a/b/g Access Point
3com
SETUP WIZARD
STATUS
LAN
WIRELESS
Channel and SSID
Security
WEP
WPA
802.1X
Access Control
WDS
TOOLS
LOG OUT
WLAN MAC Filtering Table
For a more secure Wireless network you can specify that only certain Wireless PCs can connect to the Access Point. Up to 32 MAC addresses can be added to the MAC Filtering Table. When enabled, all registered MAC addresses are controlled by the Access Rule.
Enable MAC Filtering : Yes No
Access Rule for registered MAC address : Affirm Deny
MAC Filtering Table (up to 32 stations)
ID
MAC Address

A higher level of security can be achieved for your wireless network if you use both encryption and you specify only certain wireless computers can connect to the Access Point. By default, any wireless computer that has the same Service Area Name/SSID, channel and encryption settings as the Access Point can connect to it.

If you enable this feature from a Wireless PC, it will automatically be added to the Authorised Wireless PC list.

Authorised Wireless PCs

To create a list of Wireless computers that can access the Access Point:

1. Select *Yes to* enable MAC filtering.
2. Select *Allow* for the *Access Rule*.
3. Enter upto 32 MAC addresses that you want to allow access to the network.

   This list can also be used as a deny list. If this is the required function select *Deny* as the *Access Rule*.

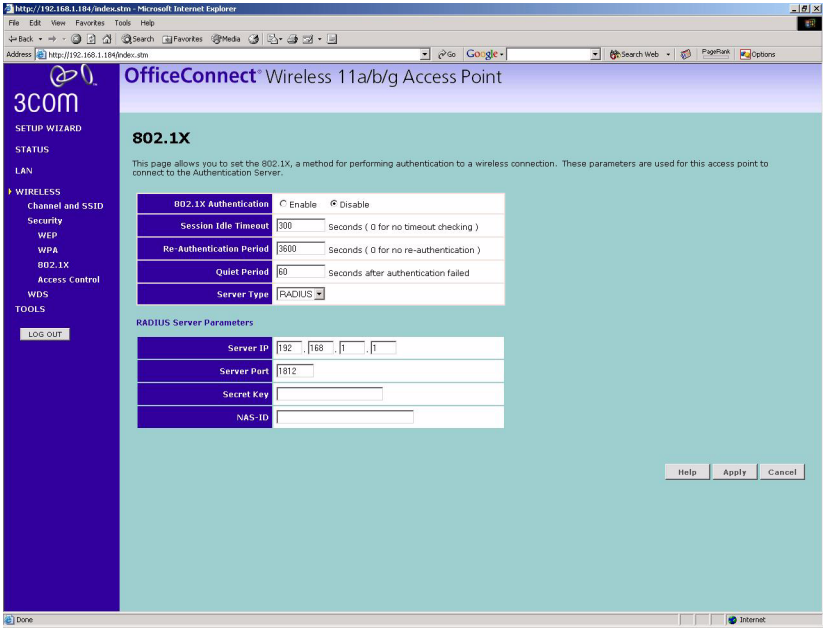
Deleting a MAC Address

The connection rights for a Wireless PC listed in the table can be removed by deleting that entry in the table.

Once an entry has been deleted it cannot be undone. Please wait 30 seconds for changes to take effect.

802.1X Authentication

Figure 22 802.1X

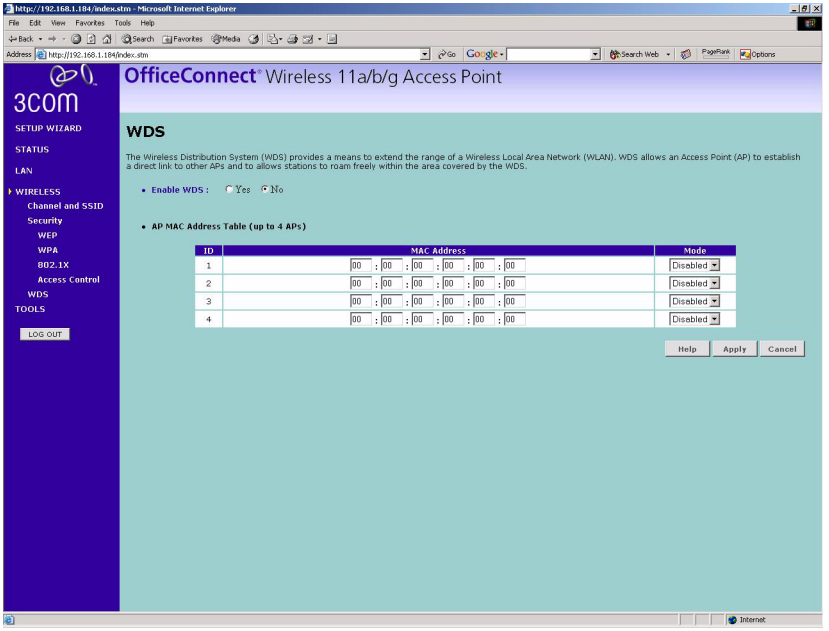


In order to use the 802.1X feature you need to have a RADIUS server on your LAN.

To set this up you will need to enter details of your RADIUS server into the fields.

WDS (Wireless Distributed System)

Figure 23 WDS



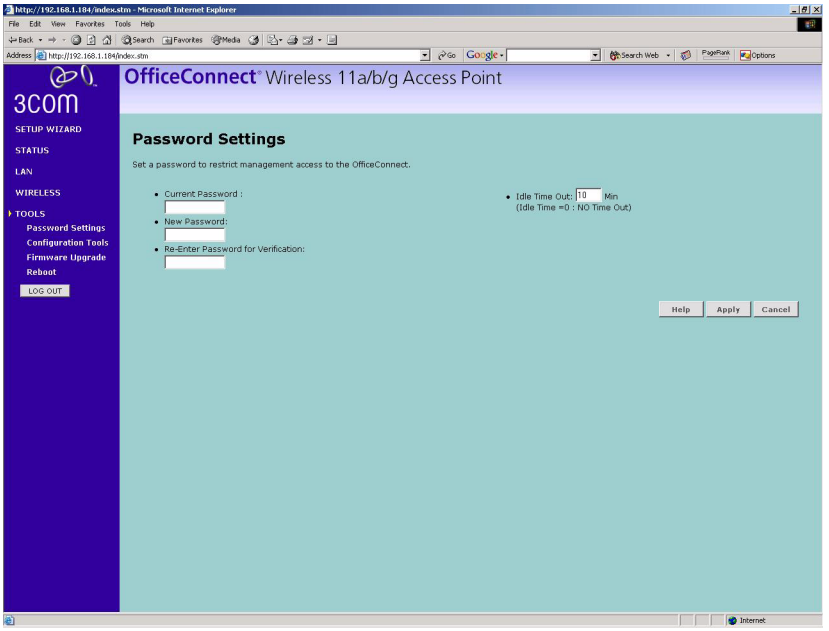
WDS allows you to make a completely wireless infrastructure. Normally, the access points must be connected to the LAN with a wire. The WDS feature allows the access points to be wirelessly connected to the LAN. This is useful when it is not possible to route a network cable to the desired site for the Access Point.

To enable this feature the MAC addresses of each access point needs to be entered into the table so that the access points are able to communicate with each other. The SSIDs and security settings also need to be the same.

The option is also given to choose if you wish to use 11a or 11g channels to connect access points.

Password

Figure 24 Password Screen



Changing the Administration Password

You can change the password to prevent unauthorized access to the Administration System. To do this:

1. Enter the current password in the *Current Password* field
2. Enter the new password in the *New Password* field
3. Enter the new password again in the *Re-Enter Password* field
4. Click *Apply* to save the new password

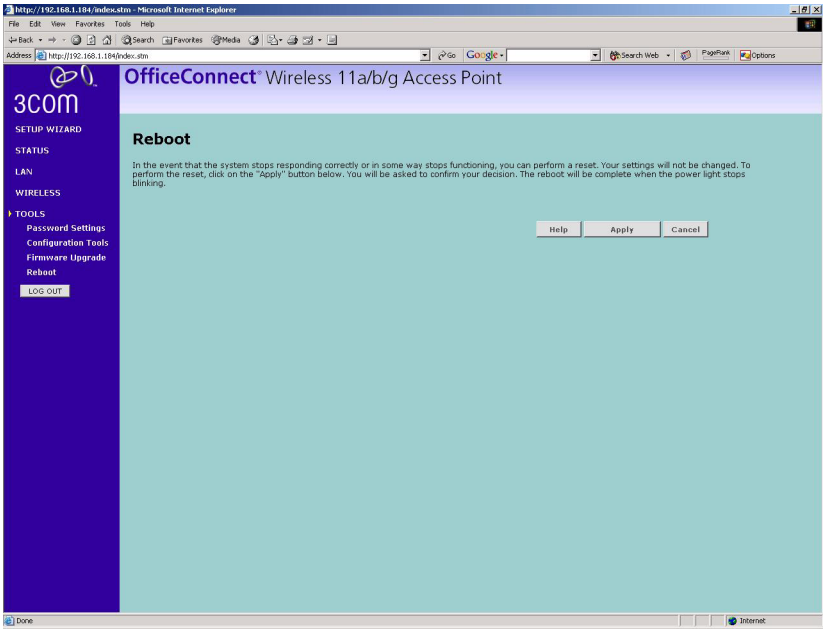
The password is case sensitive.

If you have forgotten your password you need to reset the Access Point. See "Forgotten Password and Reset to Factory Defaults" *on* page 50

System Tools

Reboot

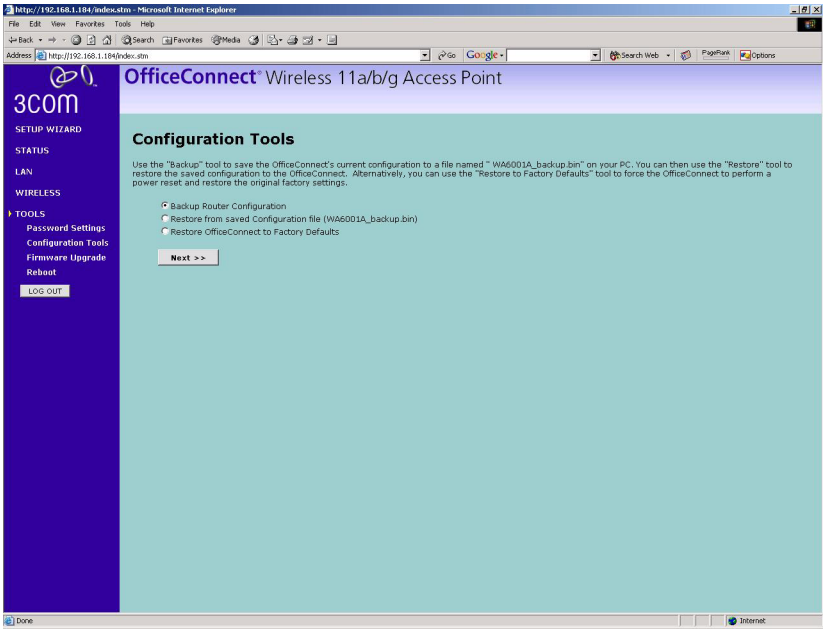
Figure 25 Reboot Screen


http://192.168.1.184/index.stm - Microsoft Internet Explorer
3com
OfficeConnect® Wireless 11a/b/g Access Point
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
Password Settings
Configuration Tools
Firmware Upgrade
Reboot
LOG OUT
Reboot
In the event that the system stops responding correctly or in some way stops functioning, you can perform a reset. Your settings will not be changed. To perform the reset, click on the "Apply" button below. You will be asked to confirm your decision. The reboot will be complete when the power light stops blinking.
Help
Apply
Cancel
Done
Internet

If your Access Point is not operating correctly, you can choose to restart the Access Point by selecting *Reboot the Access Point* and then clicking *Apply,* simulating the effect of power cycling the unit. No configuration information will be lost but the log files will be erased. Any network users who are currently connected to the Access Point will have their access interrupted whilst the restart takes place, and they may need to reboot their computers when the restart has completed and the Access Point is operational again.

Configuration Tools

Figure 26 Configuration Tools Screen


http://192.168.1.184/index.stm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.1.184/index.stm
3COM
OfficeConnect® Wireless 11a/b/g Access Point
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
Password Settings
Configuration Tools
Firmware Upgrade
Reboot
LOG OUT
Configuration Tools
Use the "Backup" tool to save the OfficeConnect's current configuration to a file named " WA6001A_backup.bin" on your PC. You can then use the "Restore" tool to restore the saved configuration to the OfficeConnect. Alternatively, you can use the "Restore to Factory Defaults" tool to force the OfficeConnect to perform a power reset and restore the original factory settings.
Backup Router Configuration
Restore from saved Configuration file (WA6001A_backup.bin)
Restore OfficeConnect to Factory Defaults
Next >>
Done
Internet

Select the *Configuration* tab to display the *Configuration* screen (Figure 26).

Backup Configuration

Select *BACKUP* to save the current Access Point configuration. You will be prompted to download and save a file to disk.

Restore Configuration Data

If you want to reinstate the configuration settings previously saved to a file, Select *Restore from Store Configuration File*.

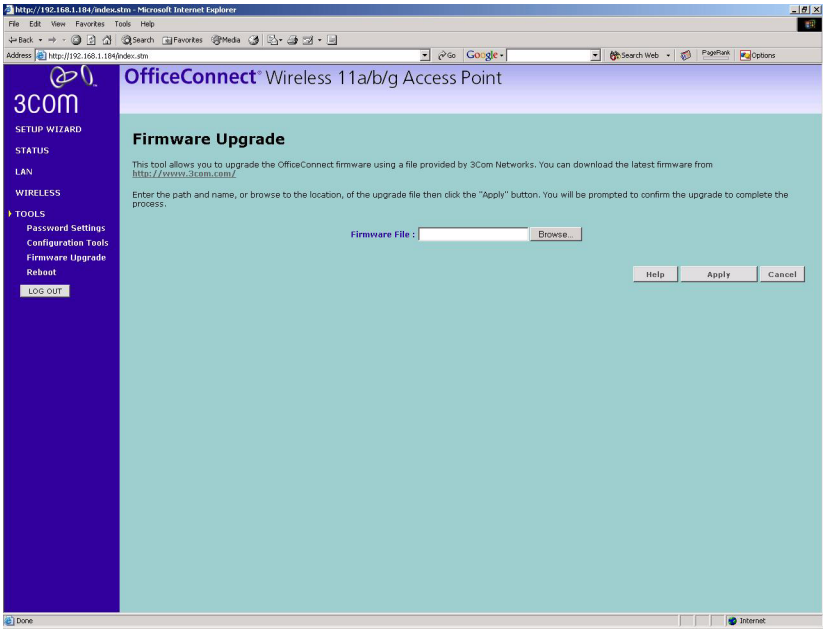
Reset to Factory Default

If you want to reset the settings on your Access Point to those that were loaded at the factory, select *Restore OfficeConnect to Factory Defaults*. You will lose all your configuration changes. The Access Point reverts to a DHCP client and will therefore restart requiring a new IP address. To communicate with the Access Point you may need to rerun the DISCOVERY software to find out the IP address of the Access Point. See Appendix A for more information. You may need to reconfigure and

restart your computer to re-establish communication with the Access Point.

Firmware Upgrade

Figure 27 Firmware Upgrade Screen


http://192.168.1.184/index.stm - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://192.168.1.184/index.stm
3com
OfficeConnect Wireless 11a/b/g Access Point
SETUP WIZARD
STATUS
LAN
WIRELESS
TOOLS
Password Settings
Configuration Tools
Firmware Upgrade
Reboot
LOG OUT
Firmware Upgrade
This tool allows you to upgrade the OfficeConnect firmware using a file provided by 3Com Networks. You can download the latest firmware from http://www.3com.com/
Enter the path and name, or browse to the location, of the upgrade file then click the "Apply" button. You will be prompted to confirm the upgrade to complete the process.
Firmware File :
Browse...
Help
Apply
Cancel
Done
Internet

The Upgrade facility allows you to install on the Access Point any new releases of system software that 3Com may make available. To install new software, you first need to download the software from the 3Com support web site to a folder on your computer. Once you have done this, select *Browse* to tell your web browser where this file is on your computer, and then click *Apply*. The file will be copied to the Access Point, and once this has completed, the Access Point will restart. Although the upgrade process has been designed to preserve your configuration settings, it is recommended that you make a backup of the configuration beforehand, in case the upgrade process fails for any reason (for example, the connection between the computer and the Access Point is lost while the new software is being copied to the Access Point).

The upgrade procedure can take up to two minutes, and is complete when the Alert LED has stopped flashing and is permanently off. Make sure that you do not interrupt power to the Access Point during the

upgrade procedure; if you do, the software may be corrupted and the Access Point may not start up properly afterwards. If the Alert LED comes on continuously after a failed upgrade, refer to Chapter 5, "Troubleshooting".

5 TROUBLESHOOTING

Basic Connection Checks

- Check that the Access Point is connected to your switch or hub and that all the equipment is powered on. Check that the LAN port link status LED on the Access Point are illuminated, and that any corresponding LEDs are also illuminated.
- Ensure that the computers have completed their start-up procedure and are ready for use. Some network interfaces may not be correctly initialised until the start-up procedure has completed.
- If the link status LED does not illuminate for the LAN port, check that you do not have a faulty cable. Try a different cable. Check also that the Uplink/Normal switch on the hub or switch is in the correct position.

Browsing to the Access Point Configuration Screens

If you have connected your Access Point, admin computer and switch together but cannot browse to the Access Point configuration screens, check the following:

- Confirm that the physical connection between your computer and the Access Point is OK, and that the link status LEDs on the Access Point and NIC are illuminated and indicating the same speed (10Mbps or 100Mbps). Some NICs do not have status LEDs, in which case a diagnostic program may be available that can give you this information.
- Ensure that your computer is configured correctly. Make sure that the computer can communicate with other devices on the network. Ensure that the NIC is configured for autonegotiation.
- Ensure that you do not have a Web proxy enabled on your computer. Go to the *Control Panel* and click on *Internet Options*. Select the *Connections* tab and click on the *LAN Settings* button at the bottom. Make sure that the *Use Proxy Server* option is unchecked.

- When entering the address of the Access Point into your web browser, ensure that you use the full URL including the http:// prefix (e.g. **`http://192.168.1.1`**).
- If you cannot browse to the Access Point, re-run the DISCOVERY software described in Appendix A to discover the Access Point and the IP address it has been allocated from the DHCP server. If there is no DHCP server on your network, the DISCOVERY software changes the IP address of the Access Point so that it is in the same subnet as your admin computer.

Forgotten Password and Reset to Factory Defaults

If you can browse to the Access Point configuration screen but cannot log on because you do not know or have forgotten the password, follow the steps below to reset the Access Point to it's factory default configuration.

CAUTION: *All your configuration changes will be lost, and you will need to run the configuration wizard again before you can re-establish your wireless network. All other computer users will lose their network connections whilst this process is taking place, so choose a time when this would be convenient.*

1. Remove power from the Access Point.
2. Hold down the *Reset* button on the rear of the unit and re-apply power to the Access Point. The Alert LED will flash as the Access Point starts up, and after approximately 30 seconds will start to flash more slowly (typically 2 seconds on, 2 seconds off). Once the Alert LED has started to flash slowly. Keep *Reset* button held down and remove power from the Access Point.
3. Release the *Reset* button.
4. Re-apply power to the Access Point, and when the start-up sequence has completed, browse to the IP address of the Access Point and run the configuration wizard. You may need to restart your computer before you attempt this.
5. When the configuration wizard has completed, you may reconnect your network as it was before.

Wireless Networking

- Ensure that you have a Wi-Fi certified 802.11a, 802.11b, or 802.11g wireless adapter for each wireless computer, and that it is correctly installed and configured. Verify that each Wireless computer has either Windows 95 or higher or MAC OS 8.5 or higher.

- Verify that your wireless computers are configured to work in Infrastructure mode and not Ad Hoc mode. The Access Point is designed to operate in Infrastructure mode. Ad Hoc mode is not supported by the Access Point.
- If you have a wired and wireless NIC in the same computer, ensure that the wired NIC is disabled.
- Check the status of the Access Point Wireless LED, it should be lit if wireless is enabled and will flash when there is wireless activity. If not lit go to "Wireless Settings" on page 33 and enable wireless networking.
- Ensure that the TCP/IP settings for all devices are correct.
- Ensure that the Wireless Clients are using the same SSID or Service Area Name as the Access Point. The SSID is case-sensitive
- Ensure that you are using the same level of security on all of your wireless computers (None, 40/64 or 128 bit) and that all devices are using the same keys, and the same order of keys where appropriate.
- Ensure that you have the Wireless computer enabled in the list of allowed MAC addresses if you are using Wireless Connection control on the Access Point.
- If you are having difficulty connecting or are operating at a low speed try changing the antenna positions on the rear of the Access Point. For more effective coverage you can try reorientating your antennae. Place one antenna vertically and one horizontally to improve coverage. Additionally consider moving the wireless computer closer to the Access Point to confirm that the building structure or fittings are not adversely affecting the connectivity. If this resolves the problem consider relocating the Wireless computer or select *Clear Channel Select* on the Access Point.
- Sources of interference: The 2.4Ghz ISM band is used for 802.11b and 802.11g. This is generally a licence free band for low power applications, and you may have other devices at your location that operate in this frequency band. You should take care to ensure that there are no devices like microwave ovens for example close to the Access Point or wireless computers as this could affect receiver sensitivity and reduce the performance of your network. If you are unsure try relocating both the wireless computers and the Access Point to establish whether this problem exists.
- Most wireless computer Adapters will scan the channels for the wireless Access Point. If a wireless computer has not located the

Access Point then try initiating a search manually if the client software supports this feature or manually set the channel on your wireless computer to correspond to the Access Point channel number. Please refer to your Wireless computer adapter documentation and vendor to do this.

- Speed of connection: The 802.11a/b/g standards will automatically choose the best speed depending on the quality of your connection. As the signal quality weakens then the speed falls back to a lower speed. In general the closer you are to the Access Point the better the speed. If you are not achieving the speed you had anticipated then try moving the antenna on the Access Point or moving the Wireless computer closer to the Access Point. In an ideal network the Access Point should be located in the centre of the network with Wireless computers distributed around it. Applications are generally available with the computer wireless card to carry out a site survey. Use this application to find the optimal siting for your wireless computer. Consult your Wireless Card documentation and vendor for more details.

Alert LED

The Alert LED will flash when the Access Point unit is first powered up while the system software checks the hardware for proper operation. Once the Access Point has started normal operation, the Alert LED will go out.

- If the Alert LED does not go out following start up, but illuminates continuously, this indicates that the software has detected a possible fault with the hardware. Remove power from the Access Point, wait 10 seconds and then re-apply power. If the Alert LED comes on continuously again, then a fault has been detected. Locate the copy of the Access Point software on the 3Com web site (**http://www.3com.com**) and upload it to the Access Point to see if this clears the fault (refer to "Recovering from Corrupted Software" below). If this does not fix the problem, contact your supplier for further advice.

Recovering from Corrupted Software

If the Alert LED remains permanently on following power-up, it is possible that the system software has become corrupted. In this condition, the Access Point will enter a "recovery" state. Follow the instructions below to upload a new copy of the system software to a Access Point unit in this state.

Ensure that one of your computers has a copy of the new software image file stored on its hard disk or available on CD-ROM.

The latest software is available on 3Com's Web site at:

www.3com.com.

1. Remove power from the Access Point and connect the admin computer to the LAN port.
2. Run the Discovery application included on the product CD.
3. This will connect you to the Microcode Recovery utility in the Access Point.
4. Follow the on-screen instructions. Enter the path and filename of the software image file.
5. When the upload has completed, the Access Point will restart, run the self-test and, if successful, resume normal operation. The Alert LED will go out.
6. Reconnect your Access Point to your network.

If the Access Point does not resume normal operation following the upload, it may be faulty. Contact your supplier for advice.

Frequently Asked Questions

How do I reset the Access Point to Factory Defaults?

See "Forgotten Password and Reset to Factory Defaults" on page 50.

How many wireless clients does the Access Point support?

A maximum of 128 wireless clients are supported.

There is a single LAN ports on the Access Point. How are additional computers connected?

You can expand the number of connections available on your LAN by using hubs, switches and wireless access points connected to the Access Point. 3Com wireless access points and OfficeConnect hubs and switches provide a simple, reliable means of expanding your network; contact your supplier for more information, or visit:

http://www.3com.com/

Where can I download software upgrades for the Access Point?

Upgrades to the Access Point software are posted on the 3Com support web site, accessible by visiting:

http://www.3com.com.

What other online resources are there?

The 3Com Knowledgebase at:

http://knowledgebase.3com.com

is a database of technical information covering all 3Com products. It is updated daily with information from 3Com technical support services, and it is available 24 hours a day, 7 days a week.

A USING DISCOVERY

Running the Discovery Application

3Com provides a user friendly Discovery application for detecting the Access Point on the network.

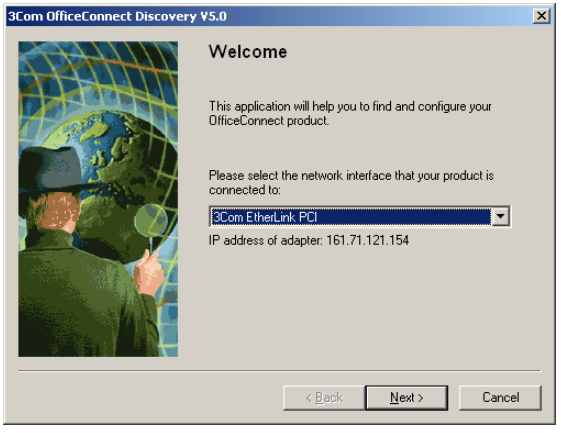
If you are unable to use the Discovery application, the Access Point on initial power-up will attempt to obtain an IP address from your local DHCP server. Consult your DHCP Server log to obtain the IP address that was allocated to your Access Point.

Windows Installation (95/98/2000/Me/ NT/XP)

1 Insert the Access Point CD-ROM in the CD-ROM drive on your computer. A menu will appear; select *Discovery*.

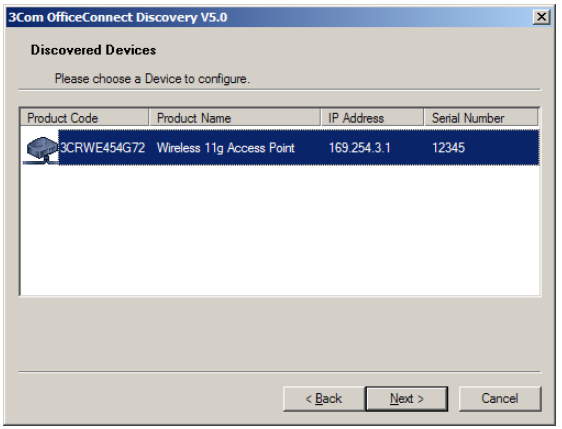
Discovery will find the Access Point even if it is unconfigured or misconfigured.

Figure 13 Discovery Welcome Screen


3Com OfficeConnect Discovery V5.0
Welcome
This application will help you to find and configure your OfficeConnect product.
Please select the network interface that your product is connected to:
3Com EtherLink PCI
IP address of adapter: 161.71.121.154
< Back
Next >
Cancel

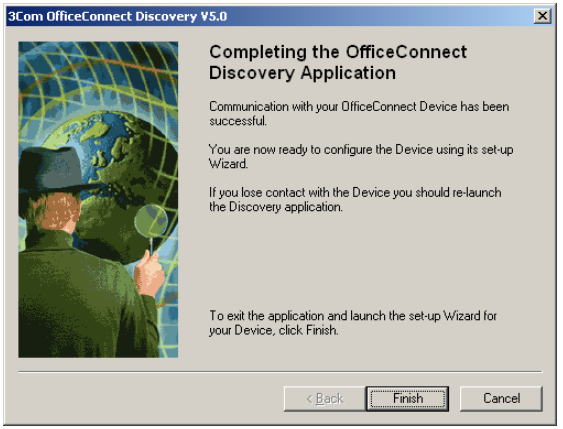
2 When the *Welcome* screen is displayed, select the NIC from which the Access Point will be discovered. Then click on *Next* and wait until the application discovers the Access Points connected to your LAN.

Figure 14 Discovered Access Point Screen



3 Figure 14 shows an example Discovered Devices screen. Highlight the *Wireless 11g Access Point* by clicking on it, and press *Next*.

Figure 15 Discovery Finish Screen


3Com OfficeConnect Discovery V5.0
Completing the OfficeConnect Discovery Application
Communication with your OfficeConnect Device has been successful.
You are now ready to configure the Device using its set-up Wizard.
If you lose contact with the Device you should re-launch the Discovery application.
To exit the application and launch the set-up Wizard for your Device, click Finish.
< Back
Finish
Cancel

4 Click on *Finish* to launch a web browser and display the login page for the Access Point.

B IP ADDRESSING

The Internet Protocol Suite

The Internet protocol suite consists of a well-defined set of communications protocols and several standard application protocols. Transmission Control Protocol/Internet Protocol (TCP/IP) is probably the most widely known and is a combination of two of the protocols (IP and TCP) working together. TCP/IP is an internationally adopted and supported networking standard that provides connectivity between equipment from many vendors over a wide variety of networking technologies.

Managing the Access Point over the Network

To manage a device over the network, the Access Point must be correctly configured with the following IP information:

- An IP address
- A Subnet Mask
- Default Gateway

IP Addresses and Subnet Masks

Each device on your network must have a unique IP address to operate correctly. An IP address identifies the address of the device to which data is being sent and the address of the destination network. IP addresses have the format n.n.n.x where n is a decimal number between 0 and 255 and x is a number between 1 and 254 inclusive.

However, an IP Address alone is not enough to make your device operate. In addition to the IP address, you need to set a subnet mask. All networks are divided into smaller sub-networks and a subnet mask is a number that enables a device to identify the sub-network to which it is connected.

For your network to work correctly, all devices on the network must have:

- The same sub-network address.
- The same subnet mask.

The only value that will be different is the specific host device number. This value must always be unique.

An example IP address is '192.168.100.8'. However, the size of the network determines the structure of this IP Address. In using the Access Point, you will probably only encounter two types of IP Address and subnet mask structures.

Type One

In a small network, the IP address of '192.168.100.8' is split into two parts:

- Part one ('192.168.100') identifies the network on which the device resides.
- Part two ('.8') identifies the device within the network.

This type of IP Address operates on a subnet mask of '255.255.255.0'.

See Table 3 for an example about how a network with three computers and a Access Point might be configured.

Table 3 IP Addressing and Subnet Masking

Device	IP Address	Subnet Mask
PC 1	192.168.100.8	255.255.255.0
PC 2	192.168.100.33	255.255.255.0
PC 3	192.168.100.188	255.255.255.0
Access Point	192.168.100.72	255.255.255.0

Type Two

In larger networks, where there are more devices, the IP address of '192.168.100.8' is, again, split into two parts but is structured differently:

- Part one ('192.168') identifies the network on which the device resides.
- Part two ('.100.8') identifies the device within the network.

This type of IP Address operates on a subnet mask of '255.255.0.0'.

See Table 4 for an example about how a network (only four computers represented) and a Access Point might be configured.

Table 4 IP Addressing and Subnet Masking

Device	IP Address	Subnet Mask
PC 1	192.168.100.8	255.255.0.0
PC 2	192.168.201.30	255.255.0.0
PC 3	192.168.113.155	255.255.0.0
PC 4	192.168.002.230	255.255.0.0
Access Point	192.168.002.72	255.255.0.0

How does a Device Obtain an IP Address and Subnet Mask?

There are three different ways to obtain an IP address and the subnet mask. These are:

- Dynamic Host Configuration Protocol (DHCP) Addressing
- Static Addressing
- Automatic Addressing (Auto-IP Addressing)

DHCP Addressing

The Acces Point can obtain an address from a DHCP server on the current network..

Static Addressing

You must enter an IP Address and the subnet mask manually on every device. Using a static IP and subnet mask means the address is permanently fixed.

Auto-IP Addressing

Network devices use automatic IP addressing if they are configured to acquire an address using DHCP but are unable to contact a DHCP server. Automatic IP addressing is a scheme where devices allocate themselves an IP address at random from the industry standard subnet of 169.254.x.x (with a subnet mask of 255.255.0.0). If two devices allocate themselves the same address, the conflict is detected and one of the devices allocates itself a new address.

Automatic IP addressing support was introduced by Microsoft in the Windows 98 operating system and is also supported in Windows 2000.

C TECHNICAL SPECIFICATIONS

This section lists the technical specifications for the OfficeConnect Wireless 11g Access Point.

Wireless 11g Access Point

Interfaces

LAN connection - 10Mbps/100Mbps dual speed Ethernet port (10BASE-T/100BASE-TX)

WLAN Interfaces

Standard IEEE 802.11a, Orthogonal Frequency Division Multiplexing (OFDM)
Transmission rate: 54Mbps, automatic fallback to 48, 36, 24, 18, 12, or 6 Mbps
Maximum channels: 20
Range up to 304.8m (1000ft)
Frequency: (US/Canada/Europe) 5.150-5.825 GHz
Sensitivity: 6, 12, 18, 24, 36, 48 Mbps: -85 dBm;
54 Mbps -66 dBm typical
Modulation: BPSK OFDM, QPSK OFDM
Encryption: 40/64 bit WEP, 128 bit WEP, 256 bit WPA
Maximum clients: 128
O/P Power: 18dBm

Standard IEEE 802.11g, Direct Sequence Spread Spectrum (DSSS)
Transmission rate: 54Mbps, automatic fallback to 48, 36, 24, 18, 12, or 6 Mbps
Maximum channels: 14
Range up to 304.8m (1000ft)
Frequency: (US/Canada/Europe) 2.400-2.4835 GHz
Sensitivity: 6, 12, 18, 24, 36, 48 Mbps: -85 dBm;

54 Mbps -66 dBm typical
Modulation: CCK, BPSK, QPSK, OFDM
Encryption: 40/64 bit WEP, 128 bit WEP, 256 bit WPA
Maximum clients: 128
O/P Power: 18dBm

Standard IEEE 802.11b, Direct Sequence Spread Spectrum (DSSS)
Transmission rate: 11bps, automatic fallback to 5.5, 2, or 1 Mbps
Maximum channels: 14
Range up to 304.8m (1000ft)
Frequency: (US/Canada/Europe) 2.400-2.4835 GHz
Sensitivity: 1, 2, 5.5 Mbps: -85 dBm; 11 Mbps -82 dBm typical
Modulation: CCK, BPSK, QPSK
Encryption: 40/64 bit WEP, 128 bit WEP, 256 bit WPA
Maximum clients: 128
O/P Power 18dBm

Operating Temperature

0 °C to 40 °C (32 °F to 105 °F)

Power

7VA, 23.9 BThU/hr

Humidity

0 % to 90 % (non-condensing) humidity

Dimensions

- Width = 220 mm (8.7 in.)
- Depth = 135 mm (5.3 in.)
- Height = 24 mm (1 in.)

Weight

Approximately 500 g (1.1 lbs)

Standards

Functional:	ISO 8802/3 IEEE 802.3 IEEE 802.11b, 802.11g, 802.11a, Wi-Fi
Safety:	UL60950 CSA 22.2 #60950

	IEC 60950 EN 60950
EMC:	EN 55022 Class B EN 55024 CISPR 22 FCC Part 15 Class B* ICES-003 Class B CNS 13438 Class A ETSI EN 301 489–17
Radio	CFR 47 FCC Part 15.207, 15.209, 15.247 and 15.249. ETS 300 328 (2.4 GHz ISM band wide band transmission systems. RSS-210
Environmental:	EN 60068 (IEC 68)

*See "FCC Statement" on page 81 for conditions of operation.

System Requirements

Operating Systems

The Access Point will support the following Operating Systems:

- Windows 95/98
- Windows NT 4.0
- Windows ME
- Windows 2000
- Windows XP
- Mac OS 8.5 or higher
- Unix

Ethernet Performance

The Access Point complies to the IEEE 802.3i, u and x specifications.

Wireless Performance

The Access Point has been designed to conform to the Wi-Fi interoperability test standard.

Wi Fi™
The Standard for Wireless Fidelity.

Cable Specifications

The Access Point supports the following cable types and maximum lengths:

- Category 3 (Ethernet) or Category 5 (Fast Ethernet or Dual Speed Ethernet) Twisted Pair — shielded and unshielded cable types.
- Maximum cable length of 100m (327.86 ft).

D SAFETY INFORMATION

Important Safety Information

***WARNING**: Warnings contain directions that you must follow for your personal safety. Follow all directions carefully.*
You must read the following safety information carefully before you install or remove the unit:

***WARNING**: The Access Point generates and uses radio frequency (rf) energy. In some environments, the use of rf energy is not permitted. The user should seek local advice on whether or not rf energy is permitted within the area of intended use.*

***WARNING**: Exceptional care must be taken during installation and removal of the unit.*

***WARNING**: Only stack the Access Point with other OfficeConnect units.*

***WARNING**: To ensure compliance with international safety standards, only use the power adapter that is supplied with the unit.*

***WARNING**: The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.*

***WARNING**: This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.*

***WARNING**: There are no user-replaceable fuses or user-serviceable parts inside the Access Point. If you have a physical problem with the unit that cannot be solved with problem solving actions in this guide, contact your supplier.*

***WARNING**: Disconnect the power adapter before moving the unit.*

***WARNING: RJ-45 ports.** These are shielded RJ-45 data sockets. They cannot be used as telephone sockets. Only connect RJ-45 data connectors to these sockets.*

Wichtige Sicherheitshinweise

***VORSICHT:** Warnhinweise enthalten Anweisungen, die Sie zu Ihrer eigenen Sicherheit befolgen müssen. Alle Anweisungen sind sorgfältig zu befolgen.*
Sie müssen die folgenden Sicherheitsinformationen sorgfältig durchlesen, bevor Sie das Geräts installieren oder ausbauen:

***VORSICHT:** Der Access Point erzeugt und verwendet Funkfrequenz (RF). In manchen Umgebungen ist die Verwendung von Funkfrequenz nicht gestattet. Erkundigen Sie sich bei den zuständigen Stellen, ob die Verwendung von Funkfrequenz in dem Bereich, in dem der Bluetooth Access Point eingesetzt werden soll, erlaubt ist.*

***VORSICHT:** Bei der Installation und beim Ausbau des Geräts ist mit höchster Vorsicht vorzugehen.*

***VORTSICHT:** Stapeln Sie das Geräts nur mit anderen OfficeConnect Gerätes zusammen.*

***VORSICHT:** Aufgrund von internationalen Sicherheitsnormen darf das Gerät nur mit dem mitgelieferten Netzadapter verwendet werden.*

***VORSICHT:** Die Netzsteckdose muß in der Nähe des Geräts und leicht zugänglich sein. Die Stromversorgung des Geräts kann nur durch Herausziehen des Gerätenetzkabels aus der Netzsteckdose unterbrochen werden.*

***VORSICHT:** Der Betrieb dieses Geräts erfolgt unter den SELV-Bedingungen (Sicherheitskleinstspannung) gemäß IEC 60950. Diese Bedingungen sind nur gegeben, wenn auch die an das Gerät angeschlossenen Geräte unter SELV-Bedingungen betrieben werden.*

VORSICHT: *Es sind keine von dem Benutzer zu ersetzende oder zu wartende Teile in dem Gerät vorhanden. Wenn Sie ein Problem mit dem Access Point haben, das nicht mittels der Fehleranalyse in dieser Anleitung behoben werden kann, setzen Sie sich mit Ihrem Lieferanten in Verbindung.*

VORSICHT: *Vor dem Ausbau des Geräts das Netzadapterkabel herausziehen.*

VORSICHT: RJ-45-Anschlüsse. *Dies sind abgeschirmte RJ-45-Datenbuchsen. Sie können nicht als Telefonanschlußbuchsen verwendet werden. An diesen Buchsen dürfen nur RJ-45-Datenstecker angeschlossen werden.*

Consignes importantes de sécurité

AVERTISSEMENT: *Les avertissements présentent des consignes que vous devez respecter pour garantir votre sécurité personnelle. Vous devez respecter attentivement toutes les consignes.*
Nous vous demandons de lire attentivement les consignes suivantes de sécurité avant d'installer ou de retirer l'appareil:

AVERTISSEMENT: *L'Access Point fournit et utilise de l'énergie radioélectrique (radio fréquence -rf). L'utilisation de l'énergie radioélectrique est interdite dans certains environnements. L'utilisateur devra se renseigner sur l'autorisation de cette énergie dans la zone prévue.*

AVERTISSEMENT: *Faites très attention lors de l'installation et de la dépose du groupe.*

AVERTISSEMENT: *Seulement entasser le moyer avec les autres moyeux OfficeConnects.*

AVERTISSEMENT: *Pour garantir le respect des normes internationales de sécurité, utilisez uniquement l'adaptateur électrique remis avec cet appareil.*

AVERTISSEMENT: *La prise secteur doit se trouver à proximité de l'appareil et son accès doit être facile. Vous ne pouvez mettre l'appareil hors circuit qu'en débranchant son cordon électrique au niveau de cette prise.*

AVERTISSEMENT: *L'appareil fonctionne à une tension extrêmement basse de sécurité qui est conforme à la norme CEI 60950. Ces conditions ne sont maintenues que si l'équipement auquel il est raccordé fonctionne dans les mêmes conditions.*

AVERTISSEMENT: *Il n'y a pas de parties remplaceables par les utilisateurs ou entretenues par les utilisateurs à l'intérieur du moyeu. Si vous avez un problème physique avec le moyeu qui ne peut pas être résolu avec les actions de la résolution des problèmes dans ce guide, contacter votre fournisseur.*

AVERTISSEMENT: *Débranchez l'adaptateur électrique avant de retirer cet appareil.*

AVERTISSEMENT: Ports RJ-45. *Il s'agit de prises femelles blindées de données RJ-45. Vous ne pouvez pas les utiliser comme prise de téléphone. Branchez uniquement des connecteurs de données RJ-45 sur ces prises femelles.*

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3Com Corporation, 5500 Great America Parkway, P.O. Box 58145, Santa Clara, CA 95052-8145 (408) 326-5000

GLOSSARY

802.11a The IEEE specification for wireless Ethernet which allows speeds of up to 54 Mbps in the 5GHz range. The standard provides for 6, 12, 24, 36, 48 and 54 Mbps data rates. The rates will switch automatically depending on range and environment

802.11b The IEEE specification for wireless Ethernet which allows speeds of up to 11 Mbps. The standard provides for 1, 2, 5.5 and 11 Mbps data rates. The rates will switch automatically depending on range and environment.

802.11g The IEEE specification for wireless Ethernet which allows speeds of up to 54 Mbps in the 2.5 GHz range. The standard provides for 6, 12, 24, 36, 48 and 54 Mbps data rates. The rates will switch automatically depending on range and environment.

10BASE-T The IEEE specification for 10 Mbps Ethernet over Category 3, 4 or 5 twisted pair cable.

100BASE-TX The IEEE specification for 100 Mbps Fast Ethernet over Category 5 twisted-pair cable.

Access Point An Access Point is a device through which wireless clients connect to other wireless clients and which acts as a bridge between wireless clients and a wired network, such as Ethernet. Wireless clients can be moved anywhere within the coverage area of the access point and still connect with each other. If connected to an Ethernet network, the access point monitors Ethernet traffic and forwards appropriate Ethernet messages to the wireless network, while also monitoring wireless client radio traffic and forwarding wireless client messages to the Ethernet LAN.

Ad Hoc mode Ad Hoc mode is a configuration supported by most wireless clients. It is used to connect a peer to peer network together without the use of an

access point. It offers lower performance than infra-structure mode, used by the Access Point. (see also Infra-structure mode.)

Auto-negotiation Some devices in the OfficeConnect range support auto-negotiation. Auto-negotiation is where two devices sharing a link, automatically configure to use the best common speed. The order of preference (best first) is: 100BASE-TX full duplex, 100BASE-TX half duplex, 10BASE-T full duplex, and 10BASE-T half duplex. Auto-negotiation is defined in the IEEE 802.3 standard for Ethernet and is an operation that takes place in a few milliseconds.

Bandwidth The information capacity, measured in bits per second, that a channel can transmit. The bandwidth of Ethernet is 10 Mbps, the bandwidth of Fast Ethernet is 100 Mbps. The bandwidth for 802.11b wireless is 11Mbps. The bandwidth for 802.11g is 54 Mbps.

Category 3 Cables One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-586 standard. Category 3 is voice grade cable and can only be used in Ethernet networks (10BASE-T) to transmit data at speeds of up to 10 Mbps.

Category 5 Cables One of five grades of Twisted Pair (TP) cabling defined by the EIA/TIA-586 standard. Category 5 can be used in Ethernet (10BASE-T) and Fast Ethernet networks (100BASE-TX) and can transmit data up to speeds of 100 Mbps. Category 5 cabling is better to use for network cabling than Category 3, because it supports both Ethernet (10 Mbps) and Fast Ethernet (100 Mbps) speeds.

Channel Similar to any radio device, the OfficeConnect Wireless 11g Access Point allows you to choose different radio channels in the wireless spectrum. A channel is a particular frequency within the 2.4GHz spectrum within which the Gateway operates.

Client The term used to described the desktop PC that is connected to your network.

DHCP Dynamic Host Configuration Protocol. This protocol automatically assigns an IP address for every computer on your network. Windows 95, Windows 98 and Windows NT 4.0 contain software that assigns IP addresses to workstations on a network. These assignments are made by

the DHCP server software that runs on Windows NT Server, and Windows 95 and Windows 98 will call the server to obtain the address. Windows 98 will allocate itself an address if no DHCP server can be found.

DNS Server Address DNS stands for Domain Name System, which allows Internet host computers to have a domain name (such as 3com.com) and one or more IP addresses (such as 192.34.45.8). A DNS server keeps a database of host computers and their respective domain names and IP addresses, so that when a domain name is requested (as in typing "3com.com" into your Internet browser), the user is sent to the proper IP address. The DNS server address used by the computers on your home network is the location of the DNS server your ISP has assigned.

Encryption A method for providing a level of security to wireless data transmissions. The OfficeConnect Wireless 11g Access Point uses two types of encryption; WPA and WEP. WPA is a more powerful level of encryption than WEP.

ESSID Extended Service Set Identifier. The ESSID is a unique identifier for your wireless network. You must have the same ESSID entered into the Access Point and each of it's wireless clients.

Ethernet A LAN specification developed jointly by Xerox, Intel and Digital Equipment Corporation. Ethernet networks use CSMA/CD to transmit packets at a rate of 10 Mbps over a variety of cables.

Ethernet Address See MAC address.

Fast Ethernet An Ethernet system that is designed to operate at 100 Mbps.

Firewall Electronic protection that prevents anyone outside of your network from seeing your files or damaging your computers.

Full Duplex A system that allows packets to be transmitted and received at the same time and, in effect, doubles the potential throughput of a link.

Half Duplex A system that allows packets to transmitted and received, but not at the same time. Contrast with full duplex.

Hub A device that regenerates LAN traffic so that the transmission distance of that signal can be extended. Hubs are similar to repeaters, in that they connect LANs of the same type; however they connect more LANs than a repeater and are generally more sophisticated.

IEEE Institute of Electrical and Electronics Engineers. This American organization was founded in 1963 and sets standards for computers and communications.

IETF Internet Engineering Task Force. An organization responsible for providing engineering solutions for TCP/IP networks. In the network management area, this group is responsible for the development of the SNMP protocol.

Infra-structure mode Infra-Structure mode is the 802.11g configuration supported by the Access Point. You will need to ensure all of your clients are set up to use infra-structure mode in order for them to communicate with the Access Point. (see also Ad Hoc mode)

IP Internet Protocol. IP is a layer 3 network protocol that is the standard for sending data through a network. IP is part of the TCP/IP set of protocols that describe the routing of packets to addressed devices. An IP address consists of 32 bits divided into two or three fields: a network number and a host number or a network number, a subnet number, and a host number.

IP Address Internet Protocol Address. A unique identifier for a device attached to a network using TCP/IP. The address is written as four octets separated with periods (full-stops), and is made up of a network section, an optional subnet section and a host section.

ISP Internet Service Provider. An ISP is a business that provides connectivity to the Internet for individuals and other businesses or organizations.

LAN Local Area Network. A network of end stations (such as PCs, printers, servers) and network devices (hubs and switches) that cover a relatively small geographic area (usually not larger than a floor or building). LANs are characterized by high transmission speeds over short distances (up to 1000 metres).

MAC Media Access Control. A protocol specified by the IEEE for determining which devices have access to a network at any one time.

MAC Address Media Access Control Address. Also called the hardware or physical address. A layer 2 address associated with a particular network device. Most devices that connect to a LAN have a MAC address assigned to them as they are used to identify other devices in a network. MAC addresses are 6 bytes long.

Network A Network is a collection of computers and other computer equipment that are connected for the purpose of exchanging information or sharing resources. Networks vary in size, some are within a single room, others span continents.

Network Interface Card (NIC) A circuit board installed into a piece of computing equipment, for example, a computer, that enables you to connect it to the network. A NIC is also known as an adapter or adapter card.

Protocol A set of rules for communication between devices on a network. The rules dictate format, timing, sequencing and error control.

RJ-45 A standard connector used to connect Ethernet networks. The "RJ" stands for "registered jack".

Server A computer in a network that is shared by multiple end stations. Servers provide end stations with access to shared network services such as computer files and printer queues.

SSID Service Set Identifier. Some vendors of wireless products use SSID interchangeably with ESSID.

Subnet Address An extension of the IP addressing scheme that allows a site to use a single IP network address for multiple physical networks.

Subnet mask A subnet mask, which may be a part of the TCP/IP information provided by your ISP, is a set of four numbers configured like an IP address. It is used to create IP address numbers used only within a particular network (as opposed to valid IP address numbers recognized by the Internet, which must assigned by InterNIC).

Subnets A network that is a component of a larger network.

Switch A device that interconnects several LANs to form a single logical LAN that comprises of several LAN segments. Switches are similar to bridges, in that they connect LANs of a different type; however they connect more LANs than a bridge and are generally more sophisticated.

TCP/IP Transmission Control Protocol/Internet Protocol. This is the name for two of the most well-known protocols developed for the interconnection of networks. Originally a UNIX standard, TCP/IP is now supported on almost all platforms, and is the protocol of the Internet.

TCP relates to the content of the data travelling through a network — ensuring that the information sent arrives in one piece when it reaches its destination. IP relates to the address of the end station to which data is being sent, as well as the address of the destination network.

Traffic The movement of data packets on a network.

WECA Wireless Ethernet Compatibility Alliance. An industry group formed to certify cross vendor interoperability and compatibility of 802.11b and 802.11g wireless networking products and to promote the standard for enterprise, small business and home environments. (see also 802.11b, 802.11g, Wi-Fi)

WEP Wired Equivalent Privacy. A shared key encryption mechanism for wireless networking. Encryption strength is 40/64 bit or 128 bit.

Wi-Fi Wireless Fidelity. This is the certification granted by WECA to products that meet their interoperability criteria. (see also 802.11b, 802.11g, WECA)

Wireless Client The term used to describe a desktop or mobile PC that is wirelessly connected to your wireless network

Wireless LAN Service Area Another term for ESSID (Extended Service Set Identifier)

Wizard A Windows application that automates a procedure such as installation or configuration.

WLAN Wireless Local Area Network. A WLAN is a group of computers and devices connected together by wireless in a relatively small area (such as a house or office).

WPA Wi-Fi Protected Access. A dynamically changing encryption mechanism for wireless networking. Encryption strength is 256 bit.

INDEX

A
Access 13
Addresses
  IP 57
Administration Password 25, 43
Automatic Addressing 59

C
Cable Specifications 64
Channels 81
Configuration
  backup 45
  restore 45
Conventions
  notice icons, About This Guide 8
  text, About This Guide 8
Country Selection 24

D
DHCP 59
Discovery Application 55

F
Forgotten Password 50

I
Internet
  addresses 57
IP Address 27, 32, 57

L
LAN 27, 32
LED 14
Login 23, 56

M
MAC Address
  deleting 41

N
Network
  addresses 57
Networking
  wireless 50
NIC
  wireless 14

P
Password 23, 43

R
Reset to Factory Defaults 45, 50
Restart 44

S
Setup Wizard 21, 31
Specifications
  technical 61
Static Addressing 59
Subnet Mask 27, 57

T
TCP/IP 57
Technical
  specifications 61
  standards 61
Time Zone 45

U
Unit Configuration 32
Upgrade 46

W
Wireless

authorised PCs 40
channel selection 34
configuration 33
connection control 39
encryption 35
LED 15
networking 50
NIC 14
service area name 34
settings 33

Regulatory Notices for the Wireless 11g Access Point

Channels

Use of the Wireless 11g Access Point is only authorized for the channels approved by each country. For proper installation, login to the management interface and select your country from the drop down list. Table 5 below details the channels permitted by the local regulatory agencies:

Table 5 Channels

Channels	Country
1–13	Australia, Austria, Bahrain, Belarus, Belgium, Chile, China, Costa Rica, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Liechtenstein, Lithuania, Luxembourg, Malaysia, Netherlands, New Zealand, Norway, Paraguay, Peru, Philippines, Poland, Portugal, Russia, Saudi Arabia, Singapore, Slovenia, South Africa, South Korea, Spain, Sweden, Switzerland, Thailand, Turkey, United Kingdom, Uruguay, Venezuela.
1–11	Argentina, Brazil, Canada, Columbia, Mexico, Taiwan, United States
10–13	France, Jordan
5–7	Israel
1–14	Japan

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Information to the User

If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the equipment with respect to the receiver.
- Move the equipment away from the receiver.
- Plug the equipment into a different outlet so that equipment and receiver are on different branch circuits.
- Consult the dealer or an experienced radio/television technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

How to Identify and Resolve Radio-TV Interference Problems

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4. In order to meet FCC emissions limits, this equipment must be used only with cables which comply with IEEE 802.3.

FCC Declaration of Conformity

We declare under our sole responsibility that the

Model:	**Description:**
3CRWE454A72	Wireless 11a/b/g Access Point

to which this declaration relates, is in conformity with the following standards or other normative documents:

- ANSI C63.4-1992 Methods of Measurement
- Federal Communications Commission 47 CFR Part 15, subpart B
  15.107 (a)Class B Conducted Limits
  15.109 (a)Class B Radiated Emissions Limits
- 15.107 (e)Class B Conducted Limits
  15.109 (g)Class B Radiated Emissions Limits

Exposure to Radio Frequency Radiation: The radiated output power of the 3Com OfficeConnect Wireless 11g Access Point is far below the FCC radio frequency exposure limits. Nevertheless, the 3Com OfficeConnect Wireless 11g Access Point shall be used in such manner that the potential for human contact during normal operation is minimized. The distance between the antennas and the user should not be less than 20 cm.

CE Statement (Europe)

This product complies with the European Low Voltage Directive 73/23/EEC, EMC Directive 89/336/EEC as amended by European Directive 93/68/EEC and the Radio and Telecommunications Terminal Equipment Directive 99/5/EC.

CSA Statement

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

BSMI Statement

警告使用者：這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

FCC

CAUTION: *To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.*

RF Exposure Compliance Statement (U.S.)

CAUTION*: The 3Com OfficeConnect Wireless 11g Access Point has been certified as a mobile computing device as per FCC Section 2.1091. In order to comply with the FCC RF exposure requirements, the 3Com OfficeConnect Wireless Cable/DSL Gateway must only be installed with approved antennas and a minimum separation distance of 20 cm (8 in) must be maintained from the antenna to any nearby persons.*

Potential RF Interference (Canada)

CAUTION*: To prevent radio interference to the licensed service, this device is intended to be operated indoors and away from windows to provide maximum shielding. Equipment (or it's transmit antenna) that is installed outdoors is subject to licensing.*

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To learn more about 3Com products and services, visit our World Wide Web site at **www.3com.com**

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